All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

www.3DArtistonline.com

3DArtist

60

Practical inspiration for the 3D community

6 ESSENTIAL PROJECTS

CG MASTERED

Discover the key tools required to achieve your 3D goals

38 PAGES OF THE BEST 3D TUTORIALS

World-class animation

DreamWorks reveals how it created the world of Turbo

CINEMA 4D R15 REVIEWED

Is this the most important update yet?

DigitalEdition GreatDigitalMags.com ISSUE 60
ip IMAGINE PUBLISHING

Create art in
unexpected places.
MODO 701
Image courtesy of Bruno Bruschi
THE FOUNDRY
www.thefoundry.co.uk/modotour
@TheFoundryVFX

Peter Bara

Personal portfolio site
www.peterbara.com
Location London
Software used Maya

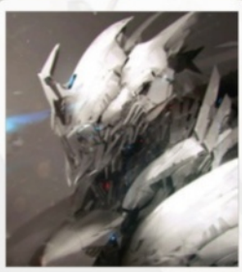
*We've got a packed issue of **3D Artist** for you over the coming pages. From tutorials on human realism, creating videogame assets, modelling a dinosaur in Blender and Bunkspeed renders to features on* Turbo, *facial animation and your top CG tools. So, what are you waiting for? Get turning!*

"Don't be scared to deviate from the Holy Trinity of three-point lighting. Practise with coloured lights and turn off GI to achieve different moods"

Peter Bara, 3D generalist and freelancer, discusses his tips for top portfolio renders **Page 40**

Master six CG projects

page 40



Original concept by Anthony Jones. See more at **www.robotpencil.org**

Welcome

to the magazine and 116 pages of amazing 3D

Hello and welcome to 3D Artist magazine! If you're looking for fast renders, then Bunkspeed PRO is for you. This issue you'll find a free 60-day trial and a tutorial from Peter Blight on p66.

Elsewhere in the mag you'll find a stunning new piece created by the extremely talented Dan Roarty. His latest human render is showcased on p50, and it's a sight to behold. Along with Blender dinosaurs, the animation of *Turbo*, your top CG projects and more, this is an issue not to be missed!

Chris Deputy Editor

Every issue you can count on...

1. **Exclusively commissioned art**
2. Behind-the-scenes guides to images and fantastic artwork
3. **A CD packed full of creative goodness**
4. Interviews with inspirational artists
5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

This issue's team of expert artists...

Dan Roarty

Realistic human rendering expert Dan created a fantastic new work for us this issue. Turn to p50 to see it

Peter Blight

Be sure to access your 60-day Bunkspeed PRO 2014 trial with this issue and follow Peter's in-depth tutorial

Rainer Duda

This issue videogame developer Rainer reveals how to create a game-ready vehicle asset using 3ds Max

Jonathan Williamson

Jonathan of the superb Blender Cookie team starts a new three-part series on open-source dinosaur-creation

Jahirul Amin

Bring your Maya environments to life using light and animation in this final part of Jahirul's series

Gustavo Åhlén

The CG guru himself is back, this time showing how to create water in CINEMA 4D and smash glass in RayFire

Dave Scotland

Master multi-pass renders in NUKE in this issue's tutorial with the ever-knowedgeable Dave Scotland

Matteo Migliorini

RealFlow expert Matteo delves into some truly unique and interesting uses for the simulation software

Furio Tedeschi

Furio discusses the new KeyShot ZBrush GoZ plug-in, and how it can greatly maximise your workflow efficiency

Tim Clapham

Few CINEMA 4D users are as experienced as Tim. As such, we asked him to put R15 under the microscope

Orestis Bastounis

Tech expert Orestis has turned his mind to mobile workstations, pitting four against one another on p94

Michael Burns

What are the best 3D tools for the core CG tasks? Michael asked a panel of experts to find out, starting on p40

Sign up, share your art and chat to other artists at www.3dartistonline.com

3DArtist

Imagine Publishing Ltd
Richmond House, 33 Richmond Hill
Bournemouth, Dorset BH2 6EZ
☎ +44 (0) 1202 586200
Web: www.imagine-publishing.co.uk
www.3dartistonline.com
www.greatdigitalmags.com

Magazine team

Deputy Editor Chris McMahon
chris.mcmahon@imagine-publishing.co.uk
☎ 01202 586239
Editor in Chief Dan Hutchinson
Staff Writer Larissa Mori
Sub Editor Tim Williamson
Senior Designer Chris Christoforidis
Photographer James Sheppard
Senior Art Editor Duncan Crook
Head of Publishing Aaron Asadi
Head of Design Ross Andrews

3dartistmagazine **@3DArtist**

Contributors
Gustavo Åhlén, Jahirul Amin, Orestis Bastounis, Peter Blight, Michael Burns, Tim Clapham, Rainer Duda, Matteo Migliorini, Dan Roarty, Dave Scotland, Furio Tedeschi, Poz Watson, Jonathan Williamson.

Advertising
Digital or printed media packs are available on request.
Advertising Director Matthew Balch ☎ 01202 586437
matthew.balch@imagine-publishing.co.uk
Head of Sales Hang Deretz ☎ 01202 586442
hang.deretz@imagine-publishing.co.uk
Advertising Manager Jennifer Farrell ☎ 01202 586430
jennifer.farrell@imagine-publishing.co.uk
Account Manager Ryan Ward ☎ 01202 586415
ryan.ward@imagine-publishing.co.uk

Cover disc
Junior Web Designer Steven Usher
3daxtrahelp@imagine-publishing.co.uk

International
3D Artist is available for licensing. Contact the International department to discuss partnership opportunities.
Head of International Licensing Cathy Blackman
☎ +44 (0) 1202 586401
licensing@imagine-publishing.co.uk

Subscriptions
Head of Subscriptions Gill Lambert
To order a subscription to **3D Artist**:
☎ UK 0844 249 0472
☎ Overseas +44 (0) 1795 592951
Email: 3dartist@servicehelpline.co.uk
6-issue subscription (UK) – £21.60
13-issue subscription (UK) – £62.40
13-issue subscription (Europe) – £70
13-issue subscription (ROW) – £80

Circulation
Head of Circulation Darren Pearce ☎ 01202 586200

Production
Production Director Jane Hawkins ☎ 01202 586200

Founders
Group Managing Director Damian Butt
Group Finance & Commercial Director Steven Boyd
Group Creative Director Mark Kendrick

Printing & Distribution
Printed by William Gibbons & Sons Ltd, 26 Planetary Road, Willenhall, West Midlands, WV13 3XT

Distributed in the UK & Eire by Seymour Distribution, 2 East Poultry Avenue, London EC1A 9PT ☎ 020 7429 4000

Distributed in Australia by Gordon & Gotch Corporate Centre, 26 Rodborough Road, Frenchs Forest, NSW 2086
☎ +61 2 9972 8800

Distributed to the rest of the world by Marketforce, Blue Fin Building, 110 Southwark Street, London SE1 0SU
☎ 020 3148 8105

Disclaimer
The publisher cannot accept responsibility for any unsolicited material lost or damaged in the post. All text and layout is the copyright of Imagine Publishing Ltd. Nothing in this magazine may be reproduced in whole or part without the written permission of the publisher. All copyrights are recognised and used specifically for the purpose of criticism and review. Although the magazine has endeavoured to ensure all information is correct at time of print, prices and availability may change. This magazine is fully independent and not affiliated in any way with the companies mentioned herein. If you submit material to Imagine Publishing via post, email, social network or any other means, you automatically grant Imagine Publishing an irrevocable, perpetual, royalty-free license to use the images across its entire portfolio, in print, online and digital, and to deliver the images to existing and future clients, including but not limited to international licensees for reproduction in international, licensed editions of Imagine products. Any material you submit is sent at your risk and, although every care is taken, neither Imagine Publishing nor its employees, agents or subcontractors shall be liable for the loss or damage.

© Imagine Publishing Ltd 2013

ISSN 1759-9636z

IMAGINE PUBLISHING

PPA

recycle
When you have finished with this magazine please recycle it

ChronoSculpt™

Time-Based Cache Sculpting for All 3D Software Pipelines

Sculpt and transform cache animation and dynamic simulation files over time with this powerful new standalone software for LightWave 3D®, 3ds Max, Maya, Modo & Cinema 4D.

Time is Finally Relative. www.chronosculpt.com

LightWave 3D is a registered trademark of NewTek, Inc. All other products, brands, trademarks or registered trademarks are the property of their respective owners.

Contents 60

What's in the magazine and where

News reviews & features

8 The Gallery
A hand-picked selection of incredible artwork to inspire you

16 Community news
Keep up-to-date with the latest news from the world of 3D

20 Readers' gallery
The 3DArtistOnline.com's community art showcase

22 Have your say
The best posts and stories from our Facebook and Twitter pages

24 Turbo: The art of DreamWorks
The top animation studio discusses the technical challenges of snails

32 The changing face of animation
We take a look at what's next for the evolving world of facial animation

40 Six essential CG projects
From portfolio renders to VFX, here are the best tools for the job

92 Subscribe today!
Save money and never miss an issue

94 Group test: Mobile workstations
We analyse the top workstations for 3D artists on the go

98 Review: CINEMA 4D R15
Tim Clapham puts Maxon's latest release to the test

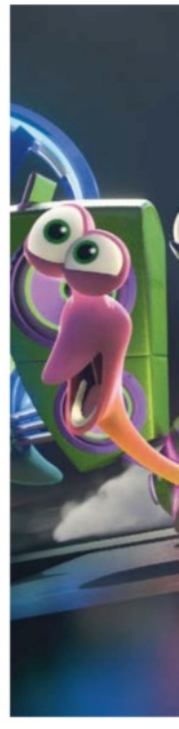
101 Review: KeyShot ZBrush GoZ plug-in
Discover how this new plug-in can maximise your workflow efficiency

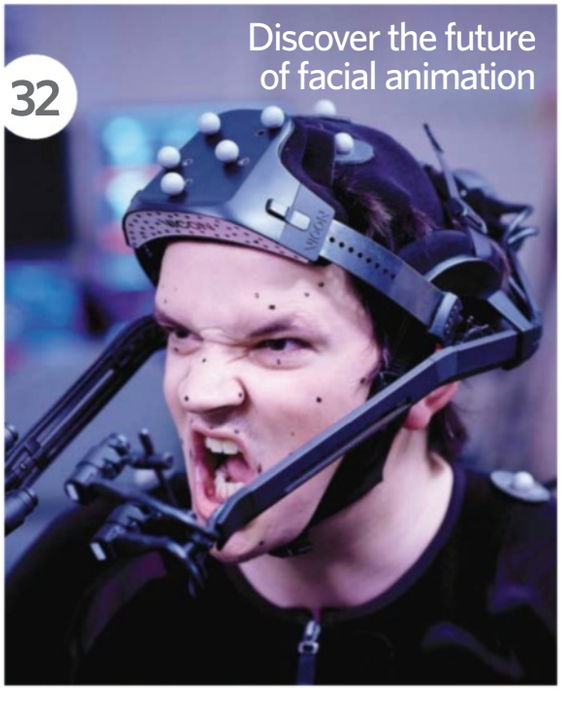
50

Ultimate human realism

"From the initial concept to final render, discover how Dan Roarty created this incredible work"

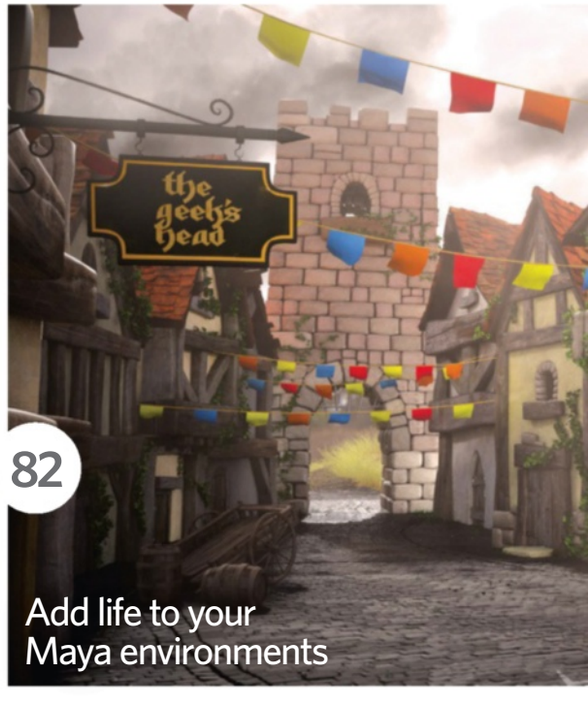
Dan Roarty, lead character artist at Crystal Dynamics/Square Enix **Page 50**





32

Discover the future of facial animation



82

Add life to your Maya environments

Free tutorial files available at:
www.3dartistonline.com/files

SAVE 40%
SUBSCRIBE TODAY

Turn to page 92 for details

58

Create a videogame vehicle asset

70

Build a Blender dinosaur

24

“I think the scale and the complexity makes it one of the more epic productions we've seen from DreamWorks”

Igor Lodeiro, CG supervisor at DreamWorks discusses the technical challenges of *Turbo* **Page 24**

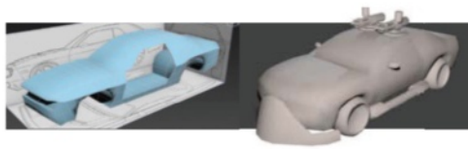
The studio

Professional 3D advice, techniques and tutorials

48 I Made This: *Next, Please*
The incredible Zhi Peng Song reveals how he created the worst queue to ever get stuck behind

50 Step by step: Ultimate human realism
Dan Roarty reveals the creation of his latest incredible work

58 Step by step: Build a vehicle game asset
It's 3ds Mad Max, in this tutorial from developer Rainer Duda



66 Step by step: Master Bunkspeed renders
Peter Blight takes us behind the scenes of his fantastic work

70 Step by step: Soft-body sculpting in Blender
Model a dinosaur with Blender Cookie's Jonathan Williamson

77 I Made This: *Portrait of Tom Waits*
Babak Bina talks us through how he made this impressive portrait

The workshop

Expert tuition to improve your skills

78 Masterclass: Water effects in CINEMA 4D
Gustavo Åhlén reveals how you can create a photoreal sheet of water in this tutorial

82 Back to basics: Maya environments
Add life to your scene in the final stage of this Maya series from Jahirul Amin

86 Questions & Answers
This section is for users who have some experience of 3D and want to learn more

RayFire: Smash windows

NUKE: Multi-pass renders

RealFlow: Raindrops on glass

workspace

Industry news, career advice & more

104 Industry news
Get up to speed with industry events

106 Project Focus: Assassin's Creed IV: Black Flag trailer
MPC reveals how it created this cinematic pirate piece

108 Industry insider: Ben Mauro
Top Hollywood concept designer Ben Mauro discusses his body of work

111 Course focus: Lost Boys Studios
Educate yourself in the ways of the Houdini TD

Visit the **3D Artist** online shop at
imagineshop.co.uk
for back issues, books and merchandise

With the Disc

- **60-day Bunkspeed PRO trial**
- **5 hours of ZBrush content**
- **49 models and textures**
- **4 hours of Blender training**

Turn to page 112 for the complete list of the disc's contents

WELCOME TO

THE GALLERY

Seven pages of great artwork from the 3D community

Images we love!

Artist info

Luigi Memola

Born in Mexico, Luigi was adopted by Italian parents, who gave him a passion for art

Personal portfolio site www.luigi-memola.com

Country Italy

Software used Rhinoceros 4, KeyShot, Photoshop

Work in progress...

"The design of the bike piloted by a droid belongs to my wider personal project in which I created a series of vehicles. The chapter CERN05 describes an extreme competition between motorcycles and droids that are piloted remotely"

Luigi Memola, *AEG27Cern 05,* 2012

"Yet another stunning example of what can be achieved with Rhinoceros in capable hands. We love the cool, sleek look of the droid and its reflective surface"

Chris Deputy Editor

Have an image you feel passionate about? Get your artwork featured in these pages

Create your gallery today at **www.3dartistonline.com**

Or get in touch... 3dartist@imagine-publishing.co.uk @3DArtist Facebook.com/3DArtistMagazine

Artist info

Giovanni Dossena

Born in Italy, Giovanni is a shader, texture and lighting artist working on feature films

Personal portfolio site
www.futureboy.it

Country Italy

Software used MARI, Maya, NUKE, V-Ray

Work in progress...

"It's impressive to see how Giovanni translated an illustrated character and concept by Júlia Sardà so beautifully in 3D, while adding his own details, such as the soft depth created with his use of lighting and 3D character design"

Larissa Staff Writer

"The expressiveness of a scene is created by capturing a single moment through the light. The research and study of surfaces, combined with proper lighting, make a simple render become a form of visual communication. I used a system of Physical Sun for the light coming through the window and an area light to set the mood in the room and on the character" **Giovanni Dossena,** *Geisha,* 2013

This stunning image is definitely not the typical advertising piece, despite the fact that it's so difficult to tear your eyes away!
Larissa Staff Writer

Artist info

Martin Houra & Adam Bartas

Martin Houra works in the CG industry and teamed up with photographer Adam Bartas to create *Blowflies*

Personal portfolio site www.houra.cz & www.adambartas.com

Country Czech Republic & New Zealand

Software used 3ds Max, V-Ray

Work in progress...

"Beauty itself can be boring, especially the retouched and enhanced images... So we wanted to contrast that with 14,000 disgusting flies"
Martin Houra & Adam Bartas, *Blowflies,* 2013

> I'm very fond of steampunk and huge mechanical and complex structures always inspire me! I intended to create a complex mechanism in this image, describing a person kept alive through a huge mechanical heart
>
> **HangShi Rui,** *Drive,* 2013

> It's hard not to love the lighting and composition of this image, your eyes are very drawn in to the central character
>
> **Larissa** Staff Writer

Artist info

Hang Shi Rui

Hang Shi Rui is a freelance artist based in Shanghai. He has been in the CG industry for two years

Country China

Software used 3ds Max, Maya, Photoshop, ZBrush

Work in progress...

This image has everything; imagination, creativity and even a bit of photorealism thrown in for good measure!

Chris Deputy Editor

Artist info

Daniil Alikov

Daniil Alikov is a 3D artist who has been working in VFX industry since 2007

Personal portfolio site www.alikov.info

Country Singapore

Software used Maya, V-Ray, ZBrush, Mudbox, NUKE, Photoshop

Work in progress...

I started this image with an original idea of doing a robo-bird. I then developed that idea to a bird-shaped, mobile welding machine made for a post-apocalyptic future. The most interesting task for me was creating the concept design

Daniil Alikov, *EGR-8*, 2013

Artist info

Lev Kononov

3DArtistonline

Username: kl3d

Personal portfolio site
www.kl3dart.blogspot.com

Country Belarus

Software used 3ds Max, ZBrush, xNormal, V-Ray, Photoshop

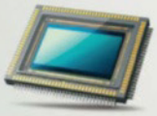
Work in progress...

"The layout, composition and atmosphere of this image work together brilliantly. It's making me want to play some *Diablo III*..."

Chris Deputy Editor

Shoot the next Hollywood blockbuster with the world's most amazing digital cinema camera!

The world's most mind blowing feature films, television commercials and music videos look amazing because they are filmed with digital film cameras! The new award winning Blackmagic Cinema Camera is unlike a regular video camera or DSLR camera because it's a true high end digital film camera! You get a true Hollywood cinematic look with 13 stops of dynamic range, interchangeable lenses, high quality RAW and ProRes® file recording plus much more!



Dramatically Better than DSLR Video

The Blackmagic Cinema Camera includes a large 2.5K sensor for super sharp images that eliminate resolution loss HD bayer sensors suffer from, while creating manageable files that are not too big! The large screen LCD allows easy focusing and the high speed SSD recorder lets you record in ProRes®, DNxHD® and RAW file formats for Final Cut Pro X and DaVinci Resolve!

Super Wide Dynamic Range

The Blackmagic Cinema Camera captures an incredible 13 stops of dynamic range so you can simultaneously capture the brightest highlights and the darkest shadows all at the same time into the recorded file! This means you capture more of the scene than a regular video camera can so you get more freedom for color correction for a feature film look! You also get a full copy of DaVinci Resolve!

Film Industry Quality

Every feature of the Blackmagic Cinema Camera has been designed for quality. With 2 separate models, you can choose from the world's most amazing EF or MFT lenses from crafters such as Canon™, Zeiss™ and more. For extreme high end work, you can shoot full 12 bit CinemaDNG RAW uncompressed files for incredible creative range in DaVinci Resolve color correction, as well as the world's best chroma keying!

Accessories Built In

High end cinema cameras often require thousands of dollars of extra accessories to make them work, however the Blackmagic Cinema Camera includes accessories you need built in! You get a large 5 inch monitor, super fast SSD RAW recorder and professional audio recorder all built in! You also get UltraScope software, used via the built in Thunderbolt™ connection, for on set waveform monitoring!

Blackmagic Cinema Camera

£1,325*

Includes DaVinci Resolve Software

*SRP is Exclusive of VAT
* Lens, accessories, props and DOP not included

Learn more today **www.blackmagicdesign.com/uk/cinemacamera**

"Mentors, peers and friends can play a huge role in the outcome of your work," says Cogliati. "Critique should be accepted with open arms and taken as a gift." A vital mentor for *Serial Taxi* was Dane Stogner, an animator at DreamWorks

The secrets behind a one-man animation project

LAIKA CG animation intern Paolo Cogliati gives us his top tips for creating a one-man short, based on his experience creating graduation film Serial Taxi

Serial Taxi

» **Paolo Cogliati**

3DA username pcogliati

Website www.paoloanimates.com, www.serialtaxi.com

Country USA

Description *Serial Taxi* was Cogliati's senior film from Ringling College of Art and Design, based on a frightening personal experience during a trip to Russia.

Bio Originally from Rome, Italy, Cogliati moved to the USA to attend Ringling College of Art and Design. It was during his second year of college that he was accepted to Gobelins for their Advanced Character Animation Workshop. He returned to Europe in 2012 to work on *Batz* as a character animator at Kawa Animation Paris. Cogliati then returned to Ringling for his final year, creating *Serial Taxi* as his graduation film. He is currently a CG animation intern on *The BoxTrolls* at LAIKA animation.

For the animated short *Serial Taxi*, Paolo Cogliati was inspired by a frightening experience in Russia, where he became convinced his taxi driver was planning to murder him on the way to the airport. Thankfully, despite his odd behaviour and the desolate route, the driver only wanted to overcharge the ride.

"Being so personal, I decided working alone on the project would allow me to jump right into what I knew I wanted to make," Cogliati explains. Created over the course of a year at Ringling College of Art and Design, his finished animation showcases the impressive amount of work that can be achieved even when producing every element of a project alone. Here, he reveals his guidelines for creating a successful solo animation.

» Assess your skillset

When working alone on a project, you cannot rely on someone else to cover your weaknesses in the pipeline. Before starting *Serial Taxi*, I made a list of my strong points and weak points and tried to form the film around that. If you are not a particularly strong lighter, don't make a film that goes through incremental weather changes and seasons!

Cogliati believes that creating an emotional narrative curve for your short will result in a more cohesive outcome

» Thoroughly plan your animatic

Due dates permitting, the best thing you can do is tie down your character personalities, acting choices and camera storytelling as much as possible through your animatic. It is hard to overstate how much time you actually save later on by having a clear and concise reference to follow.

» Create emotional curves

Something that helped me immensely in almost every step of the process was making a story-based emotional curve for the film as a whole. This allowed me to make acting choices for my characters that were appropriate to the scene they were in. When I was lighting, it let me keep colours, hues and moods connected to the emotion that I was trying to convey in the scene, such as fear, anxiety, or confusion. This creates a narrative flow that unifies each element of your film as a whole.

» Complete the hardest shots first

It is almost a basic instinct to start your film from the first shot and end with the last shot. However, start with the hardest shot first, when you are fresh and can make objective choices. After months of working against deadlines, there was nothing better than seeing that all I had left to do were the simple shots.

» Decide on the energy levels

Another trick that helped me through the animation of each of my shots was drawing an energy line for each character prior to animating. I first heard about this from animation veteran Alexandre Heboyan during my stay at Gobelins. There is nothing more boring than a character that does not feel, react or emote. Drawing a representational curve of their emotional changes over time and following this makes sure that you get the best result out of every shot you plan for.

» Use your render times productively

It is impossible to avoid long render times, whether you are in a team or not. However, being alone makes any available moment crucial. Use those five, ten, twenty minutes per render and try to open a second Maya to polish animation on a shot you have not rendered yet. Even during lighting and rendering I continued to polish and push my animation.

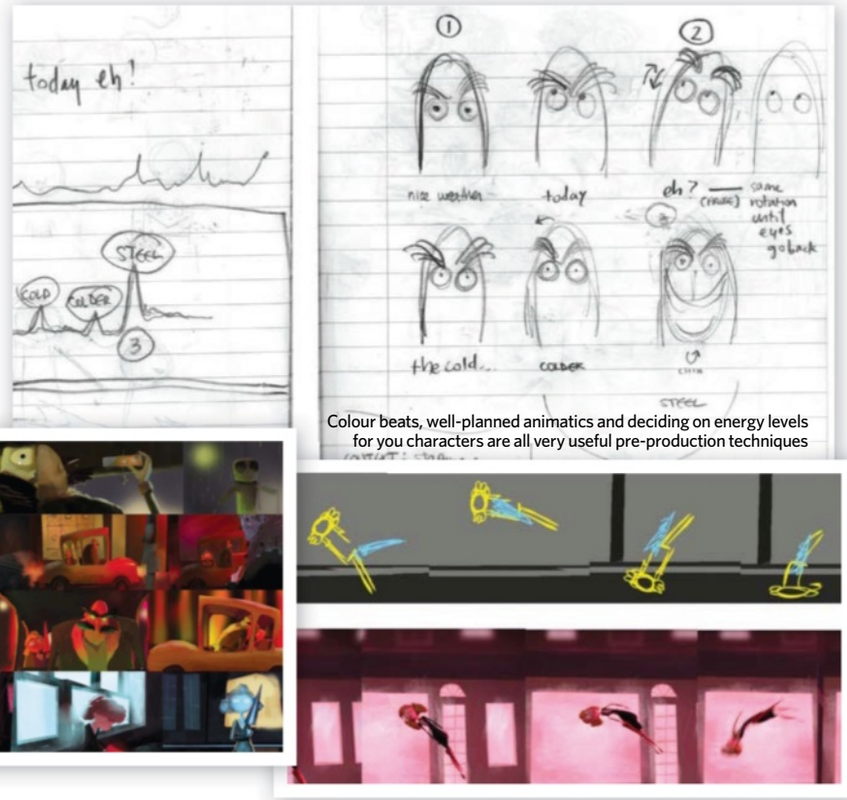
» Use dual monitors

Consider buying a second, cheap monitor to add to your setup. Working with dual monitors sped up my workflow and made me feel more organised when jumping from shot to shot.

» Consider your environment

If you can avoid it, don't work at home, and don't work in an empty room! Try to mimic a studio environment for yourself as much as possible. While private space is great, I feel like I was less likely to stray on Facebook while being surrounded by people that were working. Secondly, it gave me something to compare myself to. Working on your own, you will often miss things that a group or another individual might inadvertently remind you of.

Perspective tricks like that seen above can come in handy when framing your shorts for the most impact. However, this can come at the expense of consistent lighting, so such tricks must be used very carefully



Colour beats, well-planned animatics and deciding on energy levels for you characters are all very useful pre-production techniques

> "When working on your own, you are essentially on a smaller time-budget than some of your teamed peers. Don't be afraid to cheat a bit – even the large studios do!"

» Seek mentors and opinions from outside

Try to send your shots and work in progress to as many people as possible outside of your daily network to receive a fresh opinion on things that might or might not work. I would take this even further and try to Skype with the person a few moments before he or she watched the shot. Watching them while they were analysing my work helped, as people often cannot hide certain expressions that clearly show confusion or enjoyment.

» Film versus reel

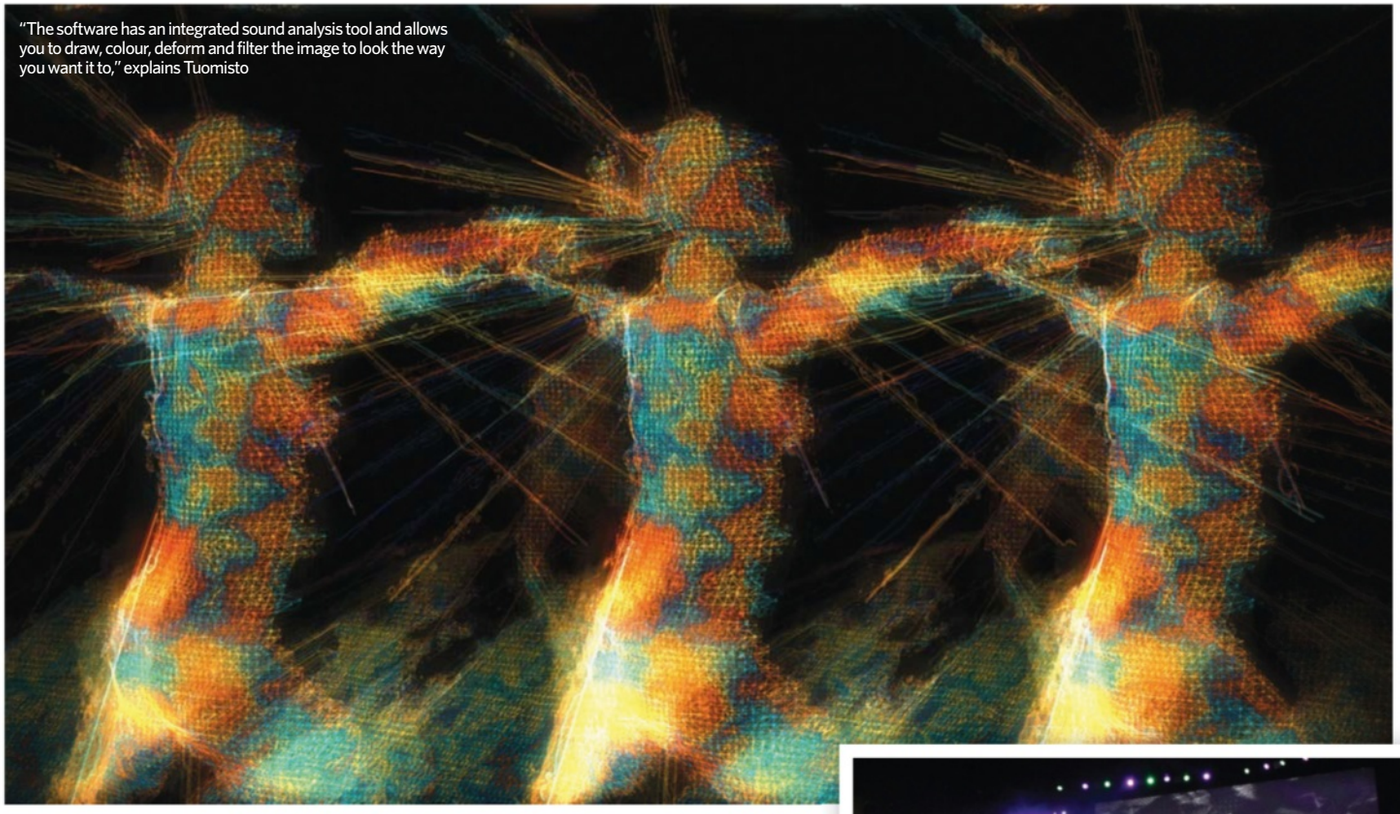
If you are a student racing towards graduation, the looming question is: "Should I make a film that has two or three good shots for my demo reel, or should I make a film that I think is, well, a good film?" The answer to that is that there is no answer. You simply must decide.

I took my mentor's advice after *Batz*, and opted to simply try and make a good film. This might be a good option for you if you're looking for more recognition; don't know precisely which part of the industry you want to work in; or simply want to make a good film because hey, how often do you get to spend an entire year doing that once you're out of school?

Cheating

Cogliati discusses shortcuts to save time on camera and lighting techniques during the animation process

"The camera is the first tool to use in cheating. Feel free to distort objects with lattices, cheat the perspective, or even have floating props and objects that don't seem to be floating as long as your camera angle hides it! Doing so will, however, affect your lighting, as you will most definitely lose or receive shadows in places you may not want. For this, I often created two lights and light-linked them. One light might be affecting the geometry, while the other light might only be in charge of generating the shadow in its proper place. Composite them together and voilà!"



"The software has an integrated sound analysis tool and allows you to draw, colour, deform and filter the image to look the way you want it to," explains Tuomisto

Breathing life into music with CG

Delicode CEO Julius Tuomisto previews the world's first video jockey tool designed to work with Microsoft Kinect

Being able to step into an alternative CG world that's in full sync with the song currently playing in your earphones sounds like something from a sci-fi novel – perhaps a futuristic update on the Walkman. For CEO of Delicode Julius Tuomisto, however, this is all just a part of his company's latest software development, Z Vector.

"A recent article by Matt Pearson on the Creators Project called for 'The Third Era of Visual Art' and stated that it would be about real-time. I couldn't agree more," begins Tuomisto. Certainly with software developments such as LightWave's NevronMotion and IKinema's LiveAction being featured at SIGGRAPH this year, the new era Pearson alluded to is just around the corner for the film and gaming industries, if it hasn't already arrived.

But perhaps less widespread is the use of real-time CG technology in the music sphere. Nevertheless, there are a growing number of musicians looking to enhance the listener's experience using vibrant real-time 3D graphics. It was when creating the music video for one such group – Finnish electro duo Phantom – that the Delicode team first had the idea to develop Z Vector.

The world's first professional VJ tool designed to work with the Microsoft Kinect, Z Vector allows users to sample and visualise a new reality in real-time, all playing in stereoscopic 3D at full HD resolution. "You can pick out single people, make the virtual camera track their movements automatically and rotate the view around the tracked person," explains Tuomisto. It was with Z Vector that the team were able to create the whole video in only twelve hours, using a mere ten takes of improvised footage captured directly to disc. "The video became popular and as the tool was real-time, I started VJing with it – initially for Phantom, but later also for other acts," he describes.

As for the third era of visual art, Tuomisto hopes to position Z Vector in the forefront of the movement for the future. As the new software's slogan states: 'The VJ is the new DJ'.

Scars – the music video by Phantom created using Z Vector – sees 3D images of the band rotating in real-time. Be sure to watch the full version of the video at **tinyurl.com/3DAPhantomScars**

Disco reality

Tuomisto discusses the benefits of including support for the Oculus Rift VR headset

"We decided to include support for the Oculus Rift out of the box," Tuomisto tells us. Though he acknowledges that real use cases for the software with the virtual reality headset are limited, Tuomisto believes that the immersion factor provided is unrivalled. "Placing the sensor device on top of the Rift and putting on a pair of earphones allows you to step into what we've come to call 'Disco Reality'. With this technology, the world around you is visualised according to the song that's currently playing."

Low-poly animation

The Masters of Pie team talk us through their distinctive new short celebrating the Olympics' Encore Anniversary

www.mastersofpie.com

Masters of Pie is currently entering film festivals with *The Olympians* short, and is working on an ambitious idea for their own character-based game. Be sure to watch *The Olympians* at **https://vimeo.com/70975460**

When London-based studio Masters of Pie was still finding its feet as a start-up, the creative team decided to create a distinctive and experimental short to explore the various artistic tools at its disposal. The result was *The Olympians*, which sees the Greek gods descend upon central London for battle – all created as a low-poly 3D animation. The successful concept piece was produced last year and was recently expanded into a full 3D short to celebrate the Olympics' Encore Anniversary this July.

Why did you decide to use low poly?

We were already big fans of the low-poly style, having been inspired by short films such as *Pivot* and *Between Bears*. We also wanted to do something in broad daylight, as I love tinkering with lighting setups and V-Ray. It felt natural to combine the faceted low-poly approach with a pseudo-realistic rendering method.

What were the main advantages and disadvantages of creating the short in this way?

From the character artist perspective, the main advantage was that the faceted style meant little to no textures were needed to create surface detail, which means no unwrapping! However, as our ideas grew bolder I ended up spending more time modelling the facets to look just the way we wanted them. I would create a standard quadded edge-looped model, then the model went into ZBrush and was sculpted up in fairly high resolution. The high-res export was then put back into 3ds Max and the Optimise modifier applied to bring the polycount right down to a riggable amount. Finally, I would cut into the model again, destroying any quads that looked too organised, and adding more organic-looking polys in key areas of detail.

From a technical standpoint, as building surfaces are generally flat, being able to render the polygon facets is tricky as lights use the surface normals to pop edges out. We then came across a Cinema 4D plug-in called Color Changer by BobTronic that randomly assigns a colour or greyscale value to each polygon.

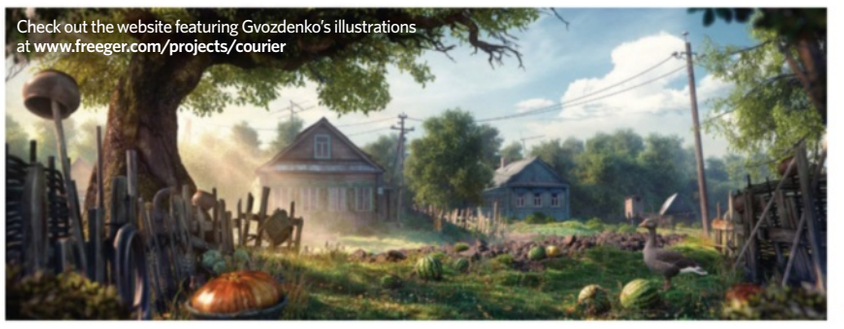
Are you planning on creating further low-poly shorts in the future?

We still love the low-poly aesthetic and would love to explore the style further with new stories and characters. We created *The Olympians* on zero budget, so building a team to produce something even bigger is definitely something we would like to look at in the future.

Detailed 3D illustrations

Freelance artist Yura Gvozdenko showcases incredible detail and use of colour in his beautifully crafted landscape illustrations

Yura Gvozdenko is currently working as a freelance artist specialising in creating illustrations and concept art for games as well as advertising. Here, he showcases the *Courier From Paradise* project – a set of illustrations from a promotional website for a Russian movie of the same name. They were created using 3ds Max, ZBrush and Photoshop.



Check out the website featuring Gvozdenko's illustrations at **www.freeger.com/projects/courier**

All About History for just £1.99

Subscribe to the awesome history magazine on iPad and iPhone to make massive savings

Packed to the brim with facts, stories and entertainment, All About History is easily the most accessible, exciting and enjoyable history magazine currently available. Take out a monthly subscription to All About History via iTunes today, and you can find the answers to the biggest historical questions for just £1.99 per issue on your iPad or iPhone.

CG vs photography

Interior design company Alma Kitchens discuss their move from photography to 3D

Though Mark Lester Ocampo works for kitchen manufacturing company Alma Kitchens, his latest work on kitchen design was achieved on a computer using CG. "Our company decided to switch from traditional photography to 3D a year ago to reduce the cost of hiring a photographer and renting locations, not to mention that we had to fix an entire kitchen, which is really time consuming," says Ocampo. He explains that ultimately there isn't much difference between traditional photography and 3D output, and clients usually will not notice that the kitchens in the imagery aren't real. The use of 3D has also allowed more flexibility when it comes to changing colours or perspective at a moment's notice. "I must add that presentation-wise, our sales team closed more projects to high-end clients than before," Ocampo reveals. "It really helps to eliminate clients' doubts as they can see what a project will look like before even signing the sales agreement."

Images of the month

These are the illustrations that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

Share your art
Register with us today at
3DArtistonline.com
www.3dartistonline.com
to view the art and chat to the artists

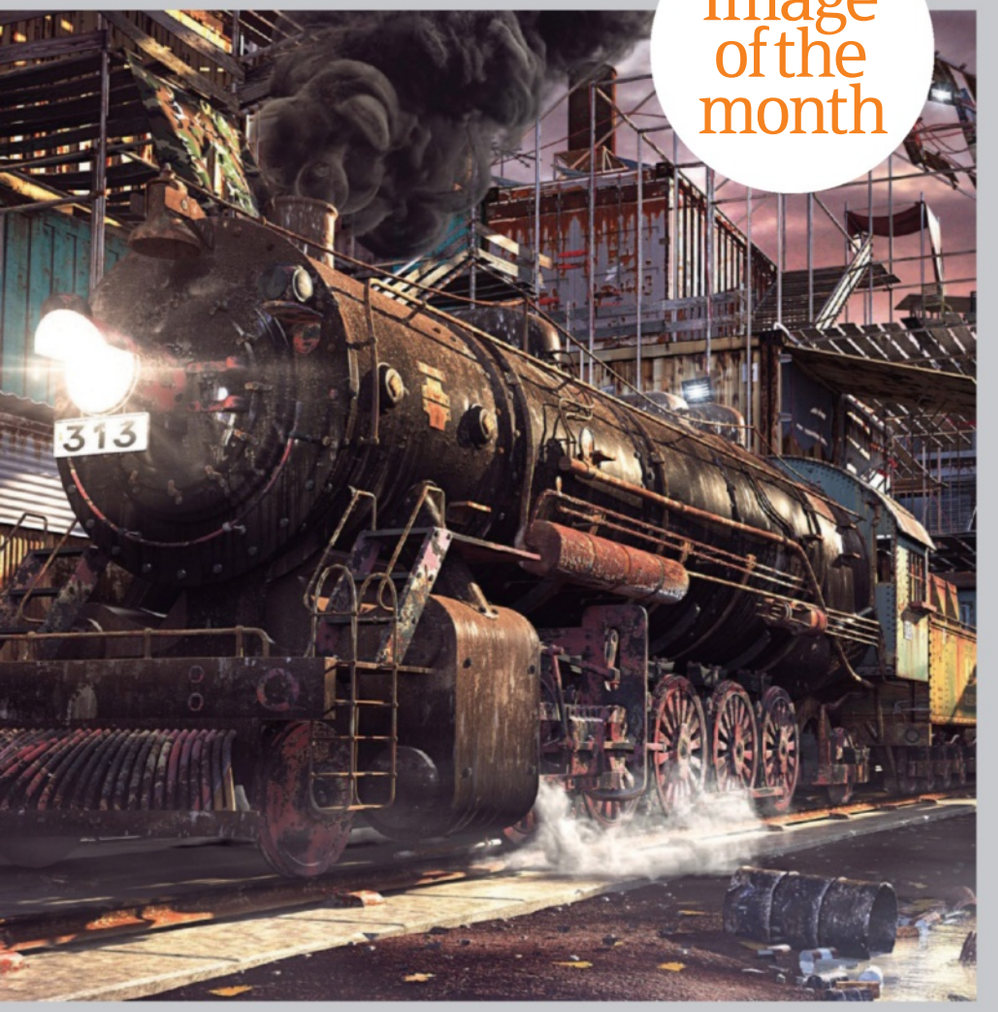
A Land of the Living
» **Dhanushka Lakmal Kannangara**
3DA username Dart12001
Dhanushka says: "A scene straight out of my imagination. I first worked on this in 2010 and it was recently reworked utilising my current knowledge of art. I used Maya and Mudbox, rendering was completed using mental ray and I composited the final image in Adobe After Effects."
We say: *Gorgeous, verdant and inviting, this is a warm and welcoming scene that looks like it could come from the more exotic stretches of Middle Earth.*

B Futuristic Slum
» **Maximilian Blank**
3DA username Rendermax
Maximilian says: "This is a concept of how a European city might look without regulated power distribution. A special thanks go out to CGTextures.com and Matthias Heimgärtner for simulating the train smoke."
We say: *Viewed in full size, this image is so packed with detail we could look at it for hours – the abandoned playground, the graffiti in the background, the towering skyscrapers. We love the juxtaposition of old and new; the steam engine sat within the futurist-dystopian surroundings.*

C Hunting Centaur
» **Marcello Baldari**
3DA username Marcello Baldari
Marcello says: "This work was my submission to the **www.badking.com.au** Monster Challenge. Work on the images took me about three days. This project gave me the time to improve my polysketch technique with a new, more efficient and faster workflow."
We say: *We saw Marcello demonstrate his imaginative polysketch technique in issue 57 of **3D Artist**. Here's another example of how it can be used to achieve simple sketches that are nevertheless packed with dynamism.*

D Alley
» **Nikos Lefas**
3DA username Nikos Lefas
Nikos says: "This is a narrow alley modelled in 3ds Max and rendered with mental ray. A trip to Hermoupolis, Siros Island capital served as the inspiration for this image. However, I felt free to play with the colours."
We say: *The use of light and composition here is incredibly well conceived; it feels like there might be something special just around that corner and we really want to find out what it is! It draws you into the image.*

Image of the month



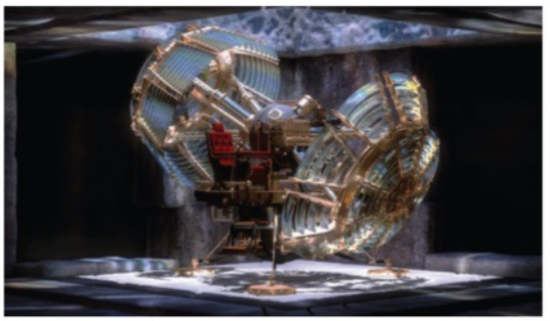
Demonic Bust

» **Thomas Lishman**

3DA username tlishman

Thomas says: "This was an experiment of speed and forms, sculpted in just one hour and rendered in KeyShot."

We say: *Thomas once again shows off his creative skills here, with another quick sculpt that exudes personality and poise. It seems that Thomas is never short of imagination when it comes to designing creatures.*



The Time Machine

» **Hameed Nawaz**

3DA username Hameed Nawaz

Hameed says: "This is an imaginative 3D model that was modelled and rendered with 3ds Max 2012. I am sharing the source file at **tinyurl.com/3DATheTimeMachine**."

We say: *We love a bit of steampunk here on **3D Artist**, and this piece is no exception. We love the glass rings encircling the pilot's seat of the contraption.*

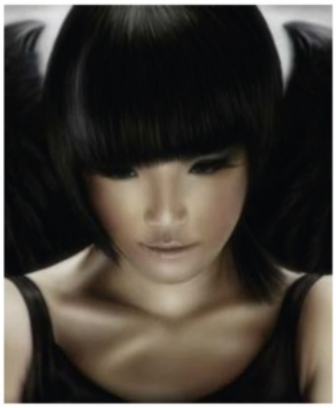
Henrik Bus Art House

» **Jeffrey Faranial**

3DA username jeffreyfaranial

Jeffrey says: "When I first saw the art house owned by fashion designer Henrik Bus I saw a great opportunity in its various elements to turn it into my own 3D rendition. The challenges posed by such an image were the driving force, from the raw-looking wood, lighting and composition to textures such as the fur."

We say: *This is just one of a great series of images. Each shows an excellent understanding of how light can be used to draw the eye.*



Dark Angel

» **Davide Franceschini**

3DA username kresta

Davide says: "I made this in Autodesk Sketchbook Pro. I was inspired by different images of angels and photos of girls. On my website **www.timecore.org** there are some close-ups containing details of the face."

We say: *We love the softness around the edges of this image. It gives the piece a rather relaxed feeling and it's a great showcase of what can be achieved in Sketchbook Pro.*

Have your say

Email, Tweet or get in touch with us on Facebook to share your thoughts, opinions and proudest projects

Top tweets

Get involved...
@3DArtist

@3DArtist What do you think of 3-Sweep, which allows you to extract editable 3D models from simple photos? bit.ly/16dEJqq

@LoganInHD @3DArtist Good Lord yes. That's an incredible piece of tech.

@Azhreicb @3DArtist When can we see some new tutorials for Vue? ZBrush seems to be the flavour of the year but let's not forget others.

@3DArtist @Azhreicb They're in the pipeline!

@dizymac Incredible, I woke up this morning to find something I worked on, on the cover of @3DArtist!

On the Wall

Facebook.com/3DArtistMagazine

Here they are, the winners of our Mech Something Awesome competition! A big thanks to all who entered with some truly brilliant work

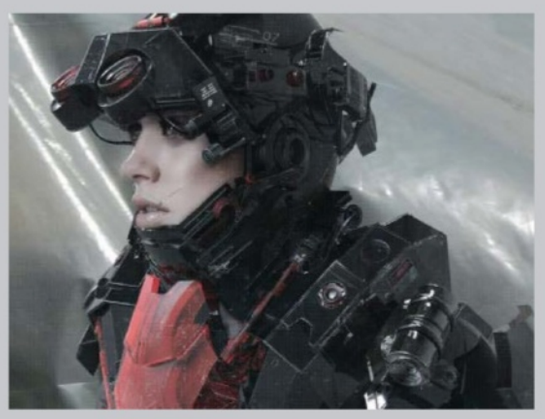
Muhammad Turko It's amazing

Derick Wicks Congrats, some great work done :D

Jerry Vittorio Like!

If you want to have your work or thoughts displayed here, get in touch with us via email at **3dartist@imagine-publishing.co.uk**, via Facebook at **facebook.com/3DArtistMagazine** or on Twitter **@3DArtist**

Social media images of the month



Combat Suit **Facebook likes** 356
» **Patryk Olejniczak • 3DA username** Patryk
Patryk says: "This is from my personal project called The Art From Space, which features sci-fi designs of characters, environments and vehicles. This particular image started as practise in ZBrush hard-surface modelling. It was rendered in KeyShot."

Rue de Seine **Facebook likes** 244
» **Viktor Fretyán**
Viktor says: "I am fond of the look of the streets in Paris, so I decided to capture them in an image. Almost everything here is modelled in 3ds Max, even the very back of the streets. It took me about six months of on-and-off work to complete it. I have hopeful plans to make this a series."

C4D Versus Maya

I'm stuck at a difficult crossroads. I'm a C4D user. I love the program. The problem is that, as of late, work as a freelancer is tough. I find myself getting little to no work. I've tried applying for studio jobs but everyone asks if I have Max or Maya experience. I browsed the net to find others who wanted to move from C4D to Maya and I found that it's a tough program to learn, with a steep learning curve, and that with Maya you nearly *have* to specialise. My worry is that, being a freelancer, you need to know something about everything for different clients, and C4D is perfect for that. Everything is approachable. Now I've decided to learn Maya, I'm nervous. Where do I start? What should I specialise in? Is it possible for one person to learn everything in Maya? Many thanks for a fantastic publication!

Paul McMahon

Changing to different software is terrifying, but you have a huge advantage coming to Maya simply by already knowing C4D. If you aren't ready to specialise, research the various areas of Maya first. Many 3D artists have created award-winning short animations entirely in Maya, so a generalist approach is definitely possible!

YOUR TOP WALL POSTS

Mechanical Spider
» **Drew Taylor**
3DA username DrewTaylor3D
Drew says: "This piece was one of my final projects in college when I graduated from Full Sail University. I made it using Maya 2013 and rendered with mental ray. This piece references a crafter's art named *A Mechanical Mind*. They make jewellery and other pieces."

Great White
» **David Dekmar**
David says: "This was a fun project to keep my skills fresh between jobs. There's nothing fancy here. I wanted to see how quickly I could finish it and I managed in about six hours. The image was modelled using polys, finished with hand-painted textures and it uses a three-point lighting setup."

ZBRUSH 4R6®

with ZRemesher

available now

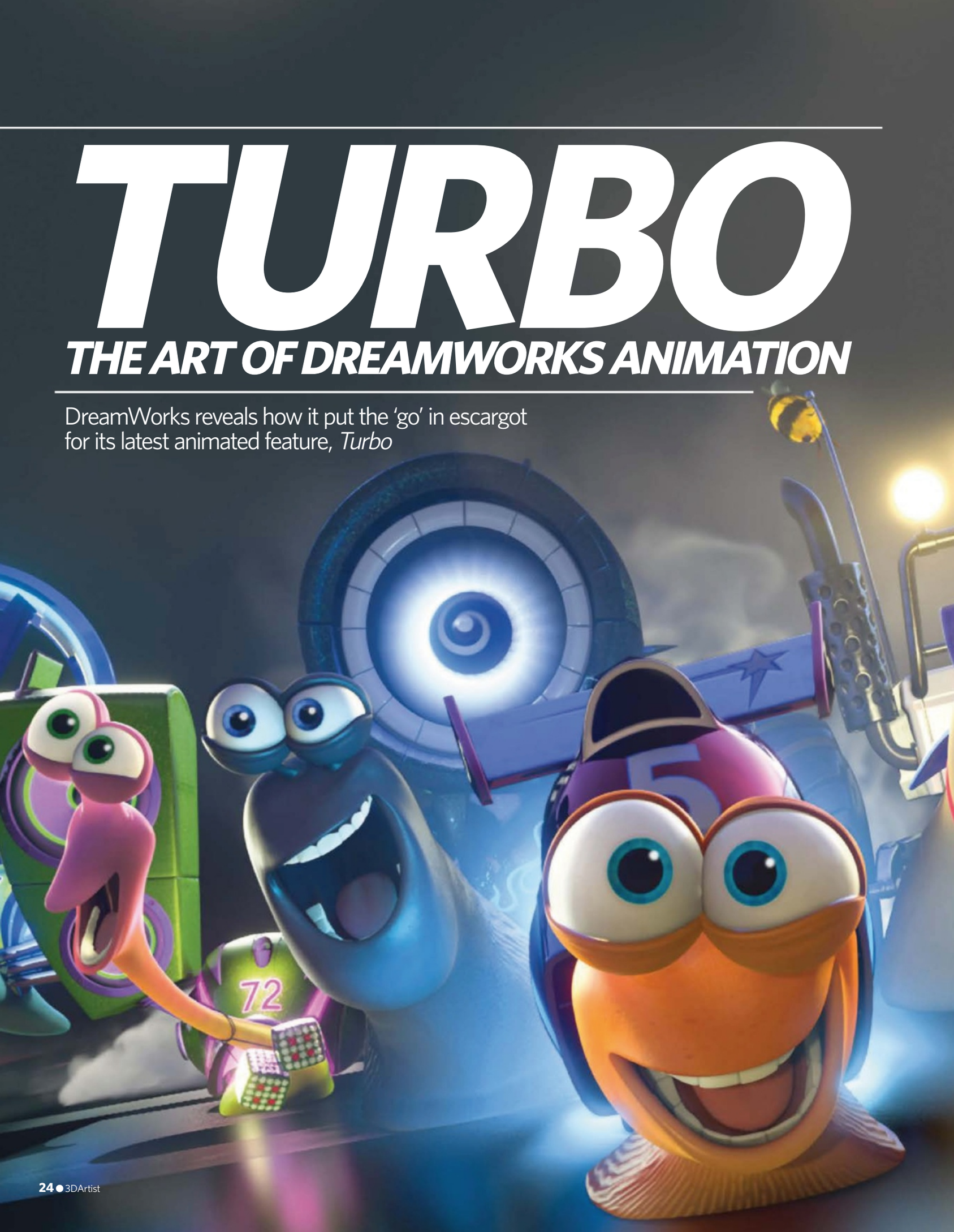
Pixologic.com
ZClassroom.com
ZBrushCentral.com

Pixologic™
makers of ZBRUSH®

TURBO

THE ART OF DREAMWORKS ANIMATION

DreamWorks reveals how it put the 'go' in escargot for its latest animated feature, *Turbo*



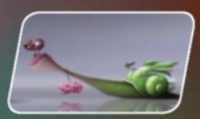
The team at DreamWorks has certainly been keeping busy. Last year alone the studio unveiled 20th Century Fox as its new distributor, along with plans to release an impressive three feature animations every year until 2016. An industry first, the release slate may seem overambitious, but if any company can do it, DreamWorks Animation certainly can.

Based on a concept by first-time director David Soren, *Turbo* tells the story of a garden snail who, rather against type, is obsessed with speed. Theo's impossible dream of winning the American Indy 500 race makes him an outcast within the slow and cautious snail community – until a freak accident turns him into Turbo, the fastest snail in the world.

"For me, it was less about trying to make a racing movie and more about finding an underdog that I could really latch on to," begins Soren. He originally pitched the animation more than five years ago, submitting it to a competition where all DreamWorks employees had the chance to present a one-page idea for the studio. Inspired by his six-year-old son's passion for race cars, Soren coined '*Fast & Furious* with snails' and won the entire contest, following which DreamWorks bought the idea. It was only years later, when he and his family moved into a new home with a backyard infested with snails, that Soren pushed for the idea once more, getting it back on the fast track into production. "I think that a snail is inherently an underdog," muses Soren. "It gets smashed and eaten by people [and] it's the butt of slow jokes around the world."

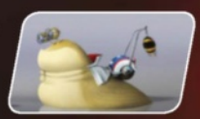
The idea of basing Turbo's dream of racing around the realities of the Indy 500 came later. "Obviously for a snail who's obsessed with speed I had this environment that I'd imagined for him where he'd sneak into his garage and escape the reality that he lived in; kind of disappear into this world of motorsport on TV. I felt that in the movie the race needed to be a real race," Soren explains. "Growing up in North America, the pinnacle of racing is the Indy 500, so for any race fan, whether human or mollusc, it seemed like the Indy would be the highest mountain to climb."

MAREK KOCHOUT
Key projects:
Turbo (2013)
Kung Fu Panda 2 (2011)
Madagascar (2005)
Shrek 2 (2004)



IGOR LODEIRO
Key projects:
Turbo (2013)
Madagascar 3: Europe's Most Wanted (2012)
Puss in Boots (2011)
How to Train Your Dragon (2010)

ALEX ONGARO
Key projects:
Kung Fu Panda 3 (2015)
Turbo (2013)
How to Train Your Dragon (2010)
Bee Movie (2007)



DAVID SOREN
Key projects:
Turbo (2013)
Over the Hedge (2006)
Shark Tale (2004)
Shrek (2001)

"I THINK THE SCALE AND THE COMPLEXITY MAKES IT ONE OF THE MORE EPIC PRODUCTIONS WE'VE SEEN FROM DREAMWORKS"
Igor Lodeiro, CG Supervisor

All images © 2013 DreamWorks Animation LLC. All Rights Reserved.

Turbo: The art of DreamWorks Animation

Soren gave the animation team a lot of creative freedom throughout the production, challenging them to bring their own ideas to the shot. "Some of them worked, some of them didn't and obviously the ones that did made it to the film," describes Kochout

Character designers created ideas and character designs in multiple styles and finishes. Finally, a single character designer would use the best parts from each concept to create a final character line-up

THE LANGUAGE OF SNAILS

Despite the very simplistic designs of the core snail characters, Turbo's complex emotions as a main character proved so hard to animate that Soren initially considered giving all the snail characters arms to overcome the problem.

"It just looked creepy," Soren confesses, telling us that despite simple appearances, the snail's development and the body language expressed were some of the biggest challenges to overcome. "There wasn't a wealth of Hollywood blockbuster snail movies to draw on! Instead, we had to look at animating expressions using the different parts of the snails' anatomies, like using their eyes to clap," he explains. There were many other tricks employed to convey emotion, such as using the snails' shells to re-create the same gestures as a human's shoulders or re-creating eyebrow shapes by altering the shape of the snails' eyelids.

As director, Soren spent the first year or so of production doing animation rounds, polishing the characters to achieve the delicate balance of keeping the snails on-model as opposed to off-model – the professional terms for the intangible qualities that make a character visually appealing to the audience, or not, throughout their performance.

This was challenging with Turbo, who had to be likeable as a hero, despite being a snail, and to be able to deliver a complex range of emotions. "He was unappealing; he was a snail," admits *Turbo* sequence supervisor Marek Kochout. "The challenge was trying to take something that was a sock puppet with two eyeballs and get complex acting out of him. A lot of work went into making sure that Turbo looked nice and that the audience would be invested in his emotions." Along with a small team of five to seven animators, Kochout would divide up the shots in a sequence launched from Soren, who reportedly gave the animation team a lot of creative freedom to bring their own ideas and input to the shots.

"We started filming ourselves with our arms by our sides in the exploration phase, trying to move across the room like snails. It was pretty pointless," remembers Kochout. "It was best to attack it like a traditional animation and work clean poses, as well as do a lot of drawing. We have tools where you can draw out poses on the screen and that's the way it went for the animation.

"I think one thing I took out of this is just how important the small triangular region of the eyes and mouth is," Kochout continues. "A common garden snail is not something that's particularly interesting to look at – not from a cute factor and not from a friendly factor. To be able to take that and have a 90-minute movie about the struggles of a

FROM BATMAN TO TURBO

For Soren to achieve his concept of marrying cartoony characters with live-action sensibilities and techniques, *The Dark Knight* and *Inception* cinematographer Wally Pfister was brought on as a creative consultant during *Turbo*'s production. "We wanted to bring someone in that could help us not only parody live-action movies and the technique that goes into making them but actually understand the lighting conditions and the camera language that would be used," explains Soren. "The problem with animation is that anything is possible; you can do things like put the camera anywhere you want. So Wally came in and we had an initial conversation, and as unlikely as it sounds, he really connected with the material; the sort of high concept idea grounded in reality, which if you think about it is exactly what Christopher Nolan has been doing with the *Batman* movies, just with a very different subject matter."

Drawings created during the character development of Tito by Devin Crane. The team had to deal with animating characters and elements to scale for both the snail's world and the human world

snail and his brother, and have the inner turmoil and the emotions that are within them come across without turning away in revulsion is really good. As for any characters that have only eyes and a nose in the future – I'm all over that."

SCALES AND TRAILS

"One thing that was interesting about this project's pipeline is that the director made extensive use of pre-visualisation," begins CG supervisor Igor Lodeiro. "He was looking at the movie early on with relatively low-quality assets and making a lot of changes about lighting, the timing of lights and the camera angles, which I think helped us quite a bit." One of the main challenges this preparatory process aided with during production was creating snail-sized assets that fit into a human-scale world, all the while making sure everything worked when going at very high speeds.

Amazingly, the effects team on *Turbo* was made up of only three artists, despite the fact that an estimated 300 people were working on the film overall. Even more incredibly, this small department was solely responsible for creating the crucial turning-point sequence where Theo first gains his super-fast powers. "It had never been done before. Usually we don't totally complete a sequence or a shot; there's always some animation or some lighting," says head of effects Alex Ongaro. "What was very crucial for us was the fact that we were now using Houdini, because it enables you to do everything, from modelling to procedural shading and rendering, without having to go to a different application, which maximised the production workflow."

The effects department was also in charge of creating the speed trail Turbo leaves behind after his change, again using Houdini as a main interface with the additional attachment of other customised tools. The team would import Turbo into Houdini from the animation department before running a Turbo-trail setup, which was created to be so automatic that a mid-level artist would be able to easily produce a scene with it.

"Another big scene for us was the car crash towards the end, where we really worked with the story department and the director to make sure we could choreograph the crash in a way that would allow us to very efficiently create something spectacular, which in Effects we always want to do," Ongaro explains. "One of my mottos is 'start simple, stay simple'. You can over-think any kind of solution. You can create this huge system for all these different possible cases of car crash, and spend 12 or even 20 weeks developing a tool and then you only use it on one shot. This isn't what I wanted to do on *Turbo*."

Turbo: The art of DreamWorks Animation

> ***WE WERE GETTING MORE AND MORE INTO INDY AND PEOPLE HAD RENDERS ON THEIR SCREENS. IF YOU'D SEEN THEM FROM A DISTANCE YOU WOULD THINK IT WAS A PHOTO***
>
> **Igor Lodeiro,** CG Supervisor

RE-CREATING THE INDY 500

"*Turbo* is one of those movies we went into thinking it will be a small project without too much complexity, but it turned out to be a giant," remembers Lodeiro.

From the start, Soren was focused on exploring the hyper-real and even crafting elements of *Turbo* based on live-action sensibilities, though the path was not so successful when developing more authentic snail characters that quickly became less likeable and more unappealing to look at. "I know that early on when they were doing tests for the characters at some stages they were looking quite realistic. However, to actually see a slimy, wet, lumpy-looking snail made them back off with that. They went more graphic with their appearance," Kochout recalls.

Despite the challenging character development, Soren's plan to create gritty, authentic environments for Turbo's LA home setting and Indianapolis races still stood strong – an idea which presented a unique juxtaposition with the more lively cartoony character designs. "For me, when you have a snail character that can go 200 miles an hour, everything else should be grounded in reality in the hope of having people root for our character," says Soren.

The result was one of the most technically complex scenes the team at

CARD-BASED CROWDS EXPLAINED

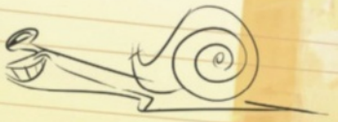
"The crowd department came up with a technique we have used in the past for other kinds of assets, but we applied it to crowds to create billboard crowds," begins CG supervisor Igor Lodeiro. "In essence, it's just a card that has a cycle mapped to it, but that also has a lot of extra information, such as normals, so that we can amend the light, as well as a bunch of texture information so we can shade those parts to look like real geometry. They even have transparency and can produce shadows," he continues. "The good thing is each one has its own cycle, so when they're far away you can see a mass of crowds, but when you are closer you start discerning individual cycles. Sometimes we weren't quite sure if they were geometric crowds or billboard crowds because they were behaving so well."

Concept by Richard Daskas & Michael Isaak

DreamWorks had ever created: an Indy 500 race so authentic it fooled actual racing drivers, who were shown early screenings from the sequence, into thinking it was from the real track. "If you had come from having a character background and then you did a shot in *Turbo*, it was like a completely different animal," recalls Lodeiro. "I'm going to give you some numbers because this was kind of crazy: in Indianapolis we had shots that had around 2,000 layers. We cannot max that; we found out we had a limit for the inputs and channels and we had to do a lot of pre-comping. We broke all the records of render layers at DreamWorks!"

Building the Indy 500 was challenging, as the crowd department had to re-create thousands of people in the stands of the biggest single-day sporting event in North America. "We had to find a way to render our shots faster than what had normally been done, otherwise we would not have completed this movie until 2020," explains Soren. The difficult task was resolved using an incredibly inventive method – by creating crowds in such a way that they didn't have to be 3D. "Our crowd department created a card system where each card would represent a certain portion of the stadium and could be flat so the humans didn't have to be three-dimensional, which reduces the rendering time. We chose angles so you couldn't tell they were flat, and we were able to render the crowd shots in a fraction of the time that we were used to," Soren describes.

"As we were getting more into Indy and people had renders on their screens, if you'd seen them from a distance, you would think it was a photo," adds Lodeiro.



Soren aimed to come up with a look for the environments, lighting and camera language that felt more realistic and based on live action, while keeping characters more graphic and cartoony

Turbo: The art of DreamWorks Animation

Three-time winner of the Indy 500 Dario Franchitti, as well as several other professional drivers, were racing expert consultants on the movie

THE NEXT STEP

Considering the amount of work and technical expertise that went into *Turbo*, it's all the more impressive that DreamWorks Animation has released both it and *The Croods* within six months of each other, particularly considering both animations feature new characters and original stories; something that even the ever-imaginative but somewhat sequel-heavy Pixar is keen on doing more of in the future.

The team doesn't seem to be slowing down anytime soon. *Turbo*'s release also marks the last film before the studio moves to its three-feature-animations-a-year slate. As incredible as the timeline is and as exciting as future projects may seem, however, it is natural to question whether the studio will be able to maintain its high level of quality, individuality and originality with so much work to be completed. Even *Turbo*, with its beautiful detail and impressive technical qualities, has received criticism for its generic narrative structure.

Whatever happens in the future, Lodeiro is certain that new developments and work on *Turbo* will be handy for DreamWorks's busy future. "We were really ambitious with this film. I don't think I've seen another movie where we've had such a gigantic group of crowds anywhere, and behaving with such realism on cycles. We also developed right around the workflow we had previously existing for crowds and took it to a new level where in many cases those crowds are sitting by human characters or hero characters that have more elaborate shading networks and they hold up.

"Our future for *Turbo* – I'm not sure about that," continues Lodeiro. "We've now produced the story that David Soren wanted to tell and it's a very funny, complex story. It has lots of parts to it, just like Turbo himself."

From a comical one-page '*Fast & Furious* with snails' concept to a worldwide feature animation, Soren himself seems to have been completely amazed at the resounding effect his vibrant racing-snail film has already had. "This past year going to the Indy 500 was ridiculous," he reveals. "You couldn't turn around without seeing snails; it was bizarre!"

Turbo in cinemas October 18th.

> ***"THERE WASN'T A WEALTH OF HOLLYWOOD BLOCKBUSTER SNAIL MOVIES AVAILABLE TO DRAW ON. WE HAD TO LOOK AT ANIMATING EXPRESSIONS USING THE DIFFERENT PARTS OF THE SNAIL'S ANATOMY"***
>
> **David Soren,** Director

ANIMATION TIMELINE

1998 Antz
1998 The Prince of Egypt
2000 The Road to El Dorado
2000 Chicken Run
2001 Shrek
2002 Spirit: Stallion of the Cimarron
2003 Sinbad: Legend of the Seven Seas
2004 Shrek 2
2004 Shark Tale
2005 Madagascar
2005 Wallace & Gromit: The Curse of the Were-Rabbit
2006 Over the Hedge
2006 Flushed Away
2007 Shrek the Third
2007 Bee Movie
2008 Kung Fu Panda
2008 Madagascar: Escape 2 Africa
2009 Monsters vs. Aliens
2010 How to Train Your Dragon
2010 Shrek Forever After
2011 Kung Fu Panda 2
2011 Puss in Boots
2012 Madagascar 3: Europe's Most Wanted
2012 Rise of the Guardians
2013 The Croods
2013 Turbo

UPCOMING FILMS

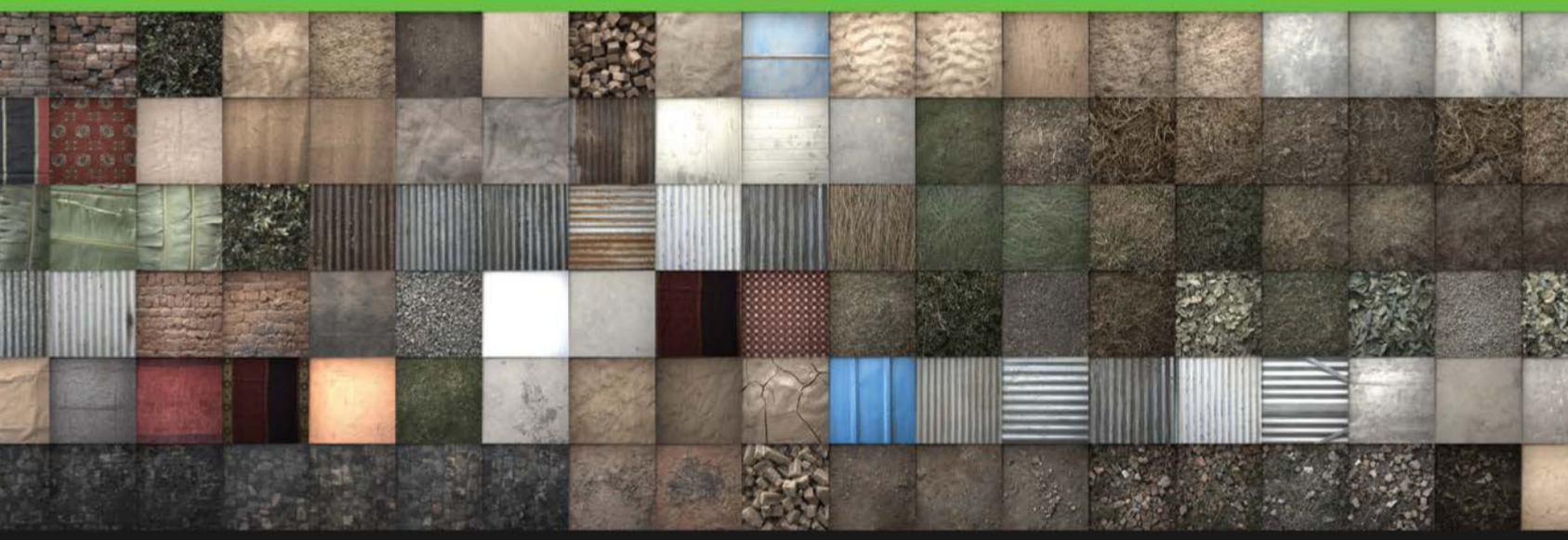
2014 Mr. Peabody & Sherman
2014 How to Train Your Dragon 2
2014 Home
2015 The Penguins of Madagascar
2015 B.O.O.: Bureau of Otherworldly Operations
2015 Kung Fu Panda 3
2016 Mumbai Musical
2016 How to Train Your Dragon 3
2016 Trolls

Quixel MEGASCANS™

- Real-world Surface Scans / Physically Based
- Up to 16K Resolution / Fully Tiled
- 32 Bit Full HDR / Consistent Exposure

quixel.se/megascans

ONLINE LIBRARY OF 6,000 SCANNED MAPS AND COUNTING



The world's largest, most diverse and highest-quality collection of surface scans.
Captured with cutting edge portable scanning technology engineered by Quixel.

Quixel™

THE CHANGING FACE OF ANIMATION

Habitual but fleeting, both universal and personal, the shapes our faces make are incredibly complex. Yet, thanks to the continual improvement of technology, we're almost capable of replicating them in the world of CG...

INTERVIEWEES

Peter Busch
Company
Faceware
Location
LA
Key projects
The Curious Case of Benjamin Button, Red Dead Redemption, Crysis 3

Gareth Edwards
Company
Cubic Motion
Location
Manchester
Key projects
Halo 4: Spartan Ops, LEGO City Undercover, Ryse: Son of Rome

Phil Elderfield
Company
Vicon
Location
Oxford
Key projects
The Polar Express, A Christmas Carol, World War Z, The Avengers

VICON
VICON

The changing face of animation

The *Polar Express* and *The Lord of the Rings* showed us what motion capture could do, *The Curious Case of Benjamin Button* let the digital double shine, and *Avatar* proved that a whole species could be brought to life with near total believability. Yet despite these successes, the infinite variety with which human beings can manipulate the 43 complex muscles in their faces means that re-creating them digitally remains a frighteningly difficult task.

Whether an animator needs to reproduce a real actor or create an imaginary character; whether the data they're working with comes from motion capture, from the Facial Action Coding System (FACS) or has to be keyframed by hand; whether the final project is supposed to be photoreal or merely a representation of reality – facial animation is one of the most demanding areas a 3D artist can work in.

Making the animator's job even more challenging is the fact that the audience – the very people they're making the animation for – is their worst enemy. We both display and read emotions subconsciously, which is how we can intrinsically tell when someone is lying, or how we can read meaning without being able to explain why, or – most importantly – how we can tell if something digital simply appears wrong.

However, facial animation seems to be reaching something of a tipping point. Emerging technology in the area was certainly one of the big talking points at SIGGRAPH 2013, with the realism that we've already seen produced in film now crossing over to the games market and the next generation of consoles.

"In film, realistic digital faces have been a hot topic for years," explains Peter Busch, VP of business development at Faceware Technologies (**www.facewaretech.com**). "Since *Polar Express* and *Final Fantasy*, animators have been getting closer and closer to attaining very realistic and very believable digital faces. Look at the work that was done on *The Curious Case of Benjamin Button* or *Avatar* and you can see just how good the film industry has gotten at this. I think where we're really beginning to see more interest now is in digital faces for videogames."

Part of the reason this is happening now is that the technologies have developed to the right point, and part of it is that the people who worked on films like *Avatar* have moved onto new projects and taken their expertise with them. Also, due to videogames' emergence as a new and exciting form of narrative, there's a continually growing desire for new releases to catch up with what we're used to seeing at the cinema.

"I think facial capture is beginning to come of age," says Phil Elderfield, product manager at Vicon (**www.vicon.com**), a leader in the mocap field. "There have been several high-profile examples over the past few years using a variety of techniques. There have been head-mounted systems capturing reference material from which animators can work their magic; performance capture with full optical systems; seated capture; surface capture; and a variety of makeup and marker-based approaches. The sheer number and variety of approaches has made the space a difficult one to navigate but the quality of the finished result that is now being seen means that the other side of the uncanny valley can almost be seen through the fog."

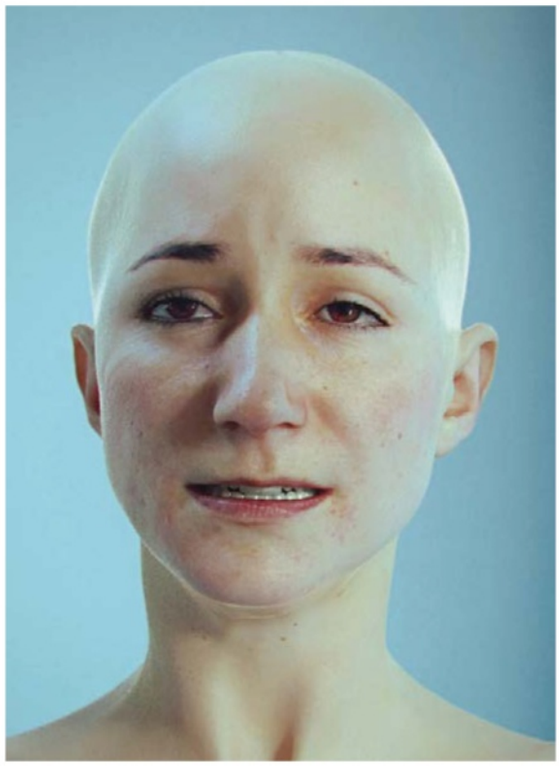
MOCAP METHODS

Motion capture has become the de facto method for combining human performance with the digital world. However, it's hardly as simple or automatic as the general public probably believes. It can capture valuable data, but it still takes a skilled team to use and manipulate that data.

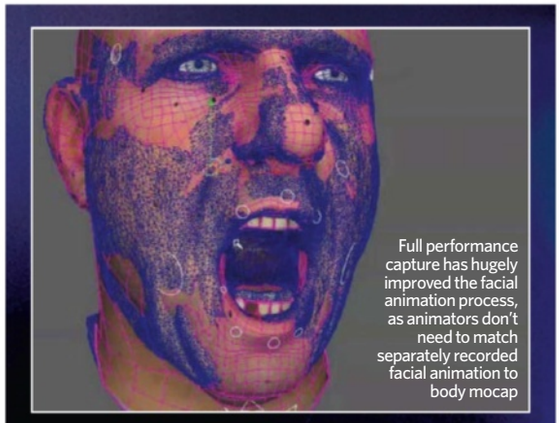
"We firmly believe that animators and creative directors are always responsible for the final quality of content," says Busch of the Faceware approach. "Involving them much sooner in the process is the key to allowing artists to do what they do best."

Nevertheless, its the skill of these animators, coupled with technological evolution of capture systems, that is enabling high-quality facial animation to appear in mediums outside the biggest Hollywood blockbusters. Elderfield explains: "Many existing workflows and processes for facial capture have been relatively labour intensive, often with significant amounts of data clean-up needed which can be a slow and costly exercise for animators. I think we are beginning to see that there are ways this can be overcome without losing the essence of the performance. This is one of the reasons why interest is spiking."

There are currently a wide array of different capture systems available, and while Elderfield believes that they will "settle and converge" eventually, he says that Vicon's approach right now is based on three-dimensional processing. "For Cara (Vicon's latest performance capture solution) we use four high-resolution cameras with high frame rates mounted on a head rig. We built this rig to be robust enough to accommodate the equipment but also open and sufficiently well balanced to be as unobtrusive as possible to the actor and the shooting process.



Cubic Motion believes that capture alone is useless, and that solving and complex rigs are just as important to achieving a solid finished result



Full performance capture has hugely improved the facial animation process, as animators don't need to match separately recorded facial animation to body mocap

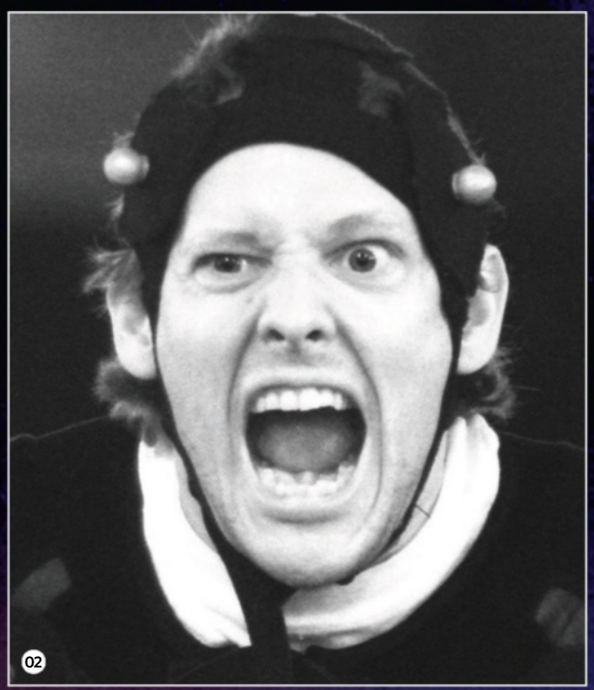
Capturing Crysis 3

Faceware recently worked with Counter Punch Studios on the AAA game *Crysis 3*. For the latest instalment, Busch explains that the team at developer Crytek wanted to vastly improve the quality of their character animation. "Crytek was using *TRON: Legacy* as a guiding factor for its quality bar. First and foremost this was an overhaul to the process of facial rig-creation. Second was a renewed focus on performance and specifically how the performances for *Crysis 3* were to be captured.

"Given the power limitations of current-gen consoles, the facial model and rig had to be simplified or it just wouldn't work on the hardware," continues Busch. "One of the biggest challenges to overcome in the asset-creation process was the culling of the photoreal scan data down onto a simplified model and rig. For example, there were artistic choices made by Counter Punch and Crytek in areas of skin volume that could not be replicated with joint or bone rigs."

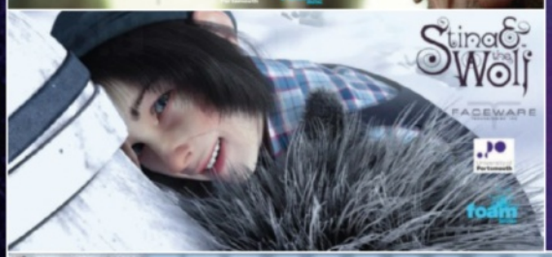
Whereas for *Crysis 2* the capture had been done in two parts – on a motion capture stage for the body, in a voiceover booth for the face – capturing all movement at the same time in *Crysis 3* improved the final performance results no end.

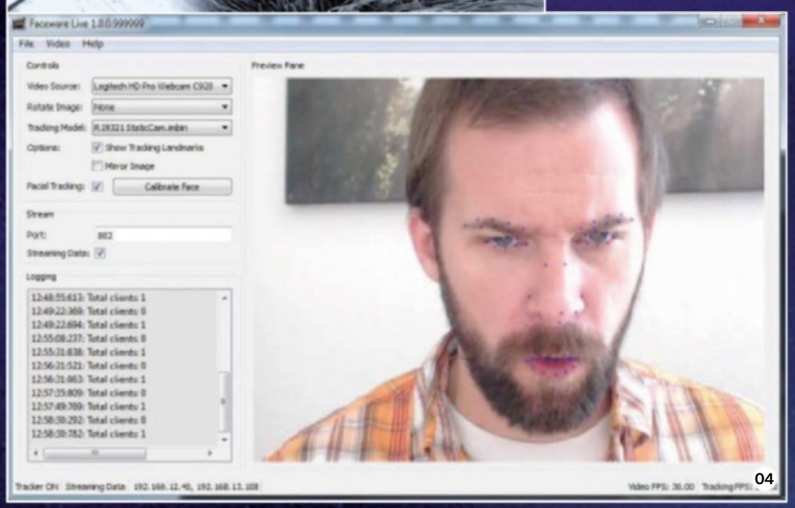
01



02

03





04

01 Faceware Retargeter plugs into Maya, 3ds Max, MotionBuilder or Softimage to produce animations with the data captured in Faceware's Analyzer package

02 Vicon's Phil Elderfield says that "getting the performance, always the performance" is what matters. "Our job is to make sure we represent the motion that happened on the day as truthfully as possible"

03 The University of Portsmouth film, *Stina and the Wolf*, has made extensive use of Faceware tech

04 Faceware Live was launched at this year's SIGGRAPH, and enables data to be captured and transferred instantly to a 3D character

> The quality of the finished result that is now being seen means that the other side of the Uncanny Valley can almost be seen through the fog...
>
> **Phil Elderfield,** Vicon

The changing face of animation

"We take data processing to the point of representing the facial motion in the form of 3D points based on face marker positions. We don't solve or apply that data to a target model. It's our job to capture motion rather than try to animate models. So it's perfectly possible with Cara to use fewer cameras or no markers and a different processing technique or backend," he explains.

One of Vicon's main goals with the technology, along with many others attempting something similar, is to minimise the amount of clean-up work an animator must carry out before the performance is production ready. "The cleaning process not only takes time but can also subtly change the data, moving it away from the original performance," says Elderfield. "We have added a lot of automation to our processing software to start addressing this."

Over at Faceware, capturing even the tiniest eye movement was the name of the game on recent project *Crysis 3*. "By leveraging our head-mounted cameras in combination with body and audio capture, Crytek captured every movement of the face, including the eyes, which are often the hardest part to capture and replicate," says Busch. "With full performance capture, the actors' eyelines were now in sync with their body and head position.

"This seemingly little factor was a massive improvement to the quality of facial animation and translated to a huge amount of time saved for our animators. All of the facial data captured by our head cams was then fed into our software products, Analyzer and Retargeter. Analyzer helps animators understand how an actor's face moves and to make creative adjustments before any animation data is applied to a character. Retargeter then takes the data from Analyzer and automatically applies it to the digital character, in this case *Crysis* character Psycho. This gave the animators a great first pass at animation from which they could further tweak the performance to their satisfaction."

> Everything should start by respecting the art you're trying to produce. Capture of any sort should be set up to serve that vision, not the other way around
>
> **Gareth Edwards,** Cubic Motion

CHOOSE THE RIGHT TOOL

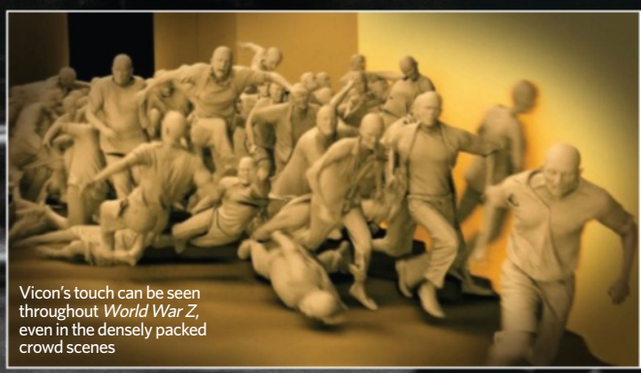
"I hate the phrase 'motion-capture movie' – it just makes no sense to me," says Gareth Edwards, CEO of British capture company Cubic Motion (**www.cubicmotion.com**). "You should have an artistic vision first, and worry about technologies later." The Cubic Motion approach is focused around its tracking technology, which can be used to track any part of the face needed for the rig. This doesn't mean just the easily visible part of the face that old-school optical marker systems can capture, but also tricky areas such as the inner lips, creases around the eyes, the furrows of the brow and so on.

Edwards, who believes the industry needs more human-face specialists, sees no downside in making measurements in the real world to inform animation. "Animators have used rotoscoping from almost the birth of the industry," he says. "In that sense, there are no downsides – it's what you choose to do with the data and, more importantly, what thinking drove you to decide to use capture in the first place. The downsides always come about when capture is treated as some sort of magic bullet, or where capture somehow drives the artistic decision-making process. Everything should start with respecting the art you're trying to produce. Capture, of any sort, should be set up to serve that vision, not the other way around."

Elderfield agrees. "The reason we're doing this in the first place is to get a performance on-screen. These tools are ultimately part of a creative process. They must serve this process and not impede it." But of course, capture can also reveal the vision: "Our focus has always been to capture the highest-quality data it's possible to achieve – anywhere. You have to have the most truthful representation of what happened on the day as a starting point from which to build your animation."

Because, after all, motion capture is not a replacement for animation. It's a supplement to it; a way of gathering valuable data and a way of bringing a coherent actor's performance to a piece, which might otherwise be impossible for a team of animators when working on a large and demanding body of work. "Motion capture is a different technique, offering different things to hand crafted animation," says Elderfield. "It's a tool in the armoury. It can stand alone as an animation source or be used as a starting point for creative animation to be built on top. Typically, the two work together to produce a final product. Motion capture can offer

> The face is one of the most important factors in good storytelling. With the power of new hardware, we're getting closer to reaching film-quality digital faces in games
>
> **Peter Busch,** Faceware

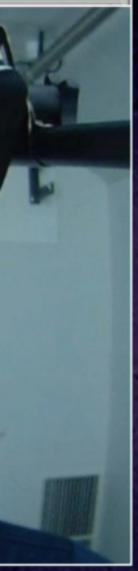


Vicon's touch can be seen throughout *World War Z*, even in the densely packed crowd scenes

Rather than a replacement for animation, motion capture is a supplement to it; a way of gathering valuable data

Using today's technology, Cubic Motion believes that no feature is impossible to get data on. As such, even the most subtle and unique of performances can be captured

One of Vicon's main goals is to minimise the amount of clean-up work required on a capture to get good data



The window to the soul

Technically speaking, Gareth Edwards says the mouth is the hardest element of the face to animate. "It's the most complex part of the face in terms of the potential changes in shape. It's also very important to get the jaw in the right place. A lot of animation based on capture – which usually only captures the surface of the skin – falls down on this."

Elderfield adds that the mouth performs a lot of tricky movements. "Motions like puffed out or sucked in cheeks, or extremely fast motions like 'raspberry blowing' lips are difficult. Higher frame rates can help."

However, no matter how perfectly you texture and sculpt a face, it's the eyes that have the most power to let you down. If there isn't that spark of life there, the whole thing falls flat. It's here where an animator needs to do both his most subtle and yet most powerful storytelling.

As Edwards puts it: "The most neglected part of face animation is usually the eyes – and that includes the wider region around them. Remember, when we're talking with somebody, we usually look at their eyes. Only animators tend to watch people's mouths!"

A smile may occur in the mouth, but you can only sell it as real if it's also communicated through the eyes

efficiencies when large amounts of character animation are required. Further animation can expand an original actor performance to add emphasis to particular motions or exaggerate while maintaining a feeling of realism in the motion."

GET YOUR GAME FACE ON

If believable, detailed facial animation is still such a big job, why are we seeing increasingly impressive examples, particularly within videogames? "There are a few factors contributing to this," starts Busch. "First, you are seeing the continued trend of highly successful, story-driven games that also happen to be very large commercial successes, such as the *Grand Theft Auto* series. As a result, a large number of gamers are starting to care much more about the actual characters, and want to see and experience their storylines."

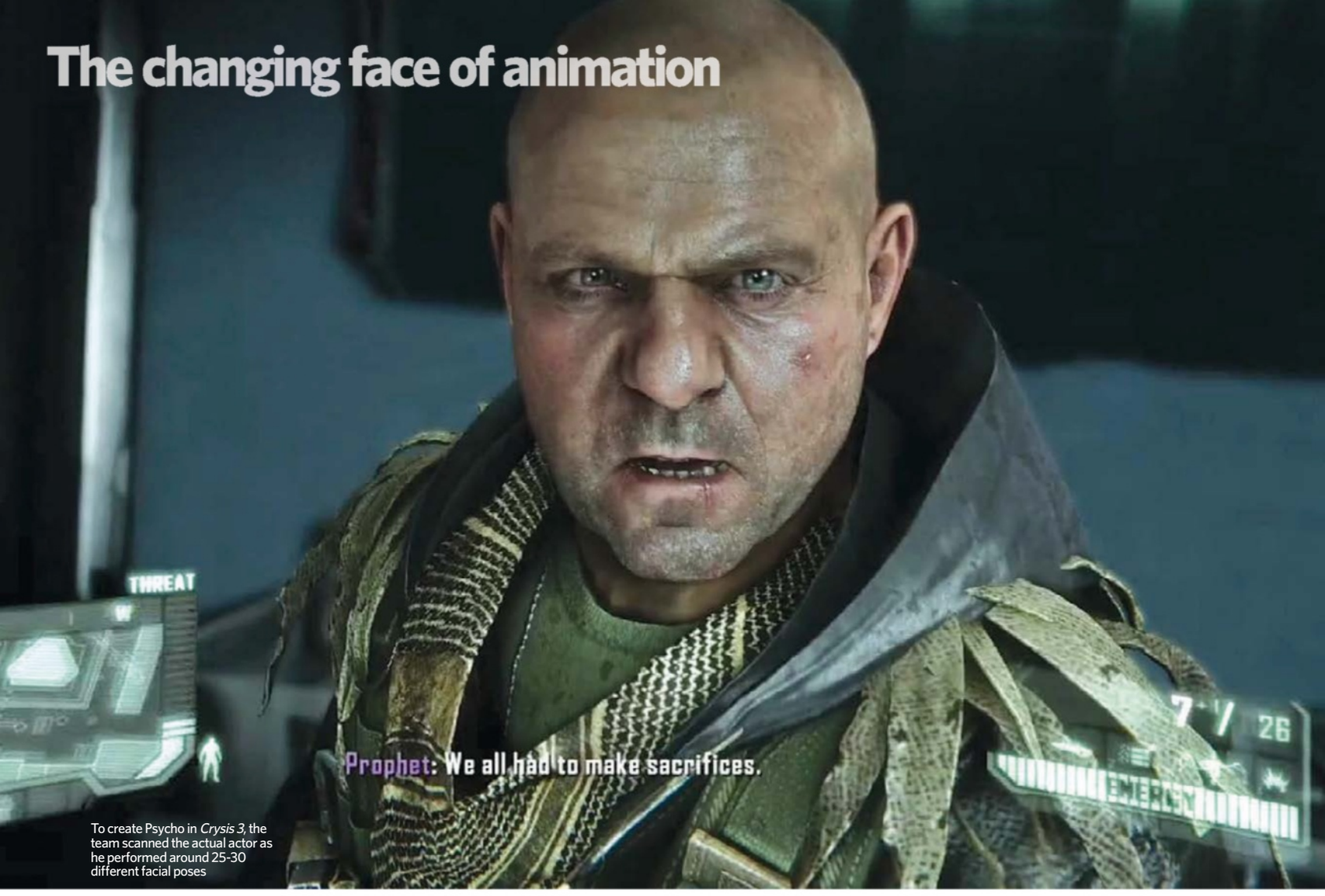
Second, Busch quotes the migration of well-respected VFX vets into the gaming world. "They're influencing videogame pipelines with all of the high-end tools and techniques for facial-capture and animation," he explains. "Faceware has secured many new projects with our software in the AAA space, with connections made years ago with our reputation built in the VFX industry."

Last, this shift comes down to the launch of next-gen consoles and the powerful hardware they offer. "This has raised the bar in terms of quality expectations. The face is arguably one of the most important factors of good storytelling and with the power of the new hardware, we're getting closer and closer to reaching film-quality results."

But while mocap is continually reaching new heights, some people think the technical process of rigging is actually holding it back. No matter how rich the data that's captured, if the rigs can't make the shapes required, then all that good work isn't going to translate.

Busch explains that while Faceware worked on both *Crysis 2* and *3*, the rigging techniques employed on the latter led to far more impressive results. "*Crysis 2* used various high-quality rigging techniques, but their models were hand-sculpted out of 2D reference art," says Busch. "However, in the case of the main characters in *Crysis 3*, including Psycho, the team scanned the actual actor as he performed around 25-30 facial poses. These poses were then re-created with a joint-based skeleton, or rig, to ensure that the facial movements were more anatomically correct. In addition, the teams at animation studio Counter Punch (**www.counterpunchstudios.com**) and Crysis made massive improvements to the lighting engine and skin shaders."

The changing face of animation



To create Psycho in *Crysis 3*, the team scanned the actual actor as he performed around 25-30 different facial poses

THE FUTURE OF FACES

"Game and film creatives are seeing that it's becoming possible to truthfully represent a facial performance," says Elderfield. "Those tasked with making it happen cost effectively and in workable time frames are beginning to see facial capture as a practical option." It's a virtuous circle: as the technologies become more refined, more people work with them. As more people work with them, the technologies become more refined.

If the ultimate goal of facial animation is for people not to know the process has even taken place, then that place is certainly on the horizon. For Elderfield, there are two main things to consider on the capture side of things: "One, ensuring the best possible quality of source data is acquired and two, ensuring that this is done in a way that doesn't obscure or restrict the performance or the shooting process. Head-mounted systems help with this and this is where the interest is right now. The mechanics and electronics of these systems will reduce in size and increase in power as is typical with this kind of tech. This will help drive us towards the goal of making the noticeable presence of the tech recede in favour of the creative process. That is what I believe we need to work towards."

Elderfield sees a desire to move from 2D capture systems to 3D ones. "The key here is the ability to actually record a true representation of the motion that happened on the day in every dimension rather than using 2D as the source and making some inferences or model-based decisions about the depth of motion," he explains. "Again this has an impact on the capture tech with the need to ensure that the data captured actually contains that 3D information. However, I think 2D will continue to have an important place, particularly in real-time where motion resolution is possibly less crucial. Real-time facial capture and processing for pre-vis and virtual production is another area where we'll see significant advances in the coming years as face capture becomes more ubiquitous and creatives begin to demand it, just as it happened with body capture.

"As facial capture becomes the norm, there will be increasing pressure for it to become less of a hassle or distraction for the actors. Processing without the need for markers will see a surge in the not-too-distant future and there are some amazing examples around," concludes Elderfield. "Less markers and less gear mean less intrusion, which means better performances when it comes to the capture process."

Beyond the Uncanny Valley

While no one would argue that cinema has offered some impressively realistic examples of facial animation, there hasn't yet been a character you could call absolutely perfect, or utterly indistinguishable from a living, breathing human being. There's always a tell that gives away the digital actor's true nature. Elderfield agrees: "We're not there yet, but we're getting closer. However, as is so often the case, the last 10% could easily take 80% of the time. I think we've got a few years before we get results that are completely convincing."

Of course, as often as it's discussed, photorealism isn't always the animator's end goal. "Believability depends on context," says Edwards. "For example, a photoreal character popping up in the middle of a *Simpsons* episode wouldn't look believable in that world at all. The goal is to produce content that looks absolutely believable inside the world you've created, and – in most cases – to be able to create this efficiently in high-volume production."

Thanks to ever-improving technology and the increasing talents of animators, completely convincing CG characters could be less than a decade away

Maximise Productivity

3D Design, Visualisation, Analysis/Simulation, Rendering, and more…

Image Courtesy of Sanders Shiers

Workstation Specialists

Powered by

intel inside XEON

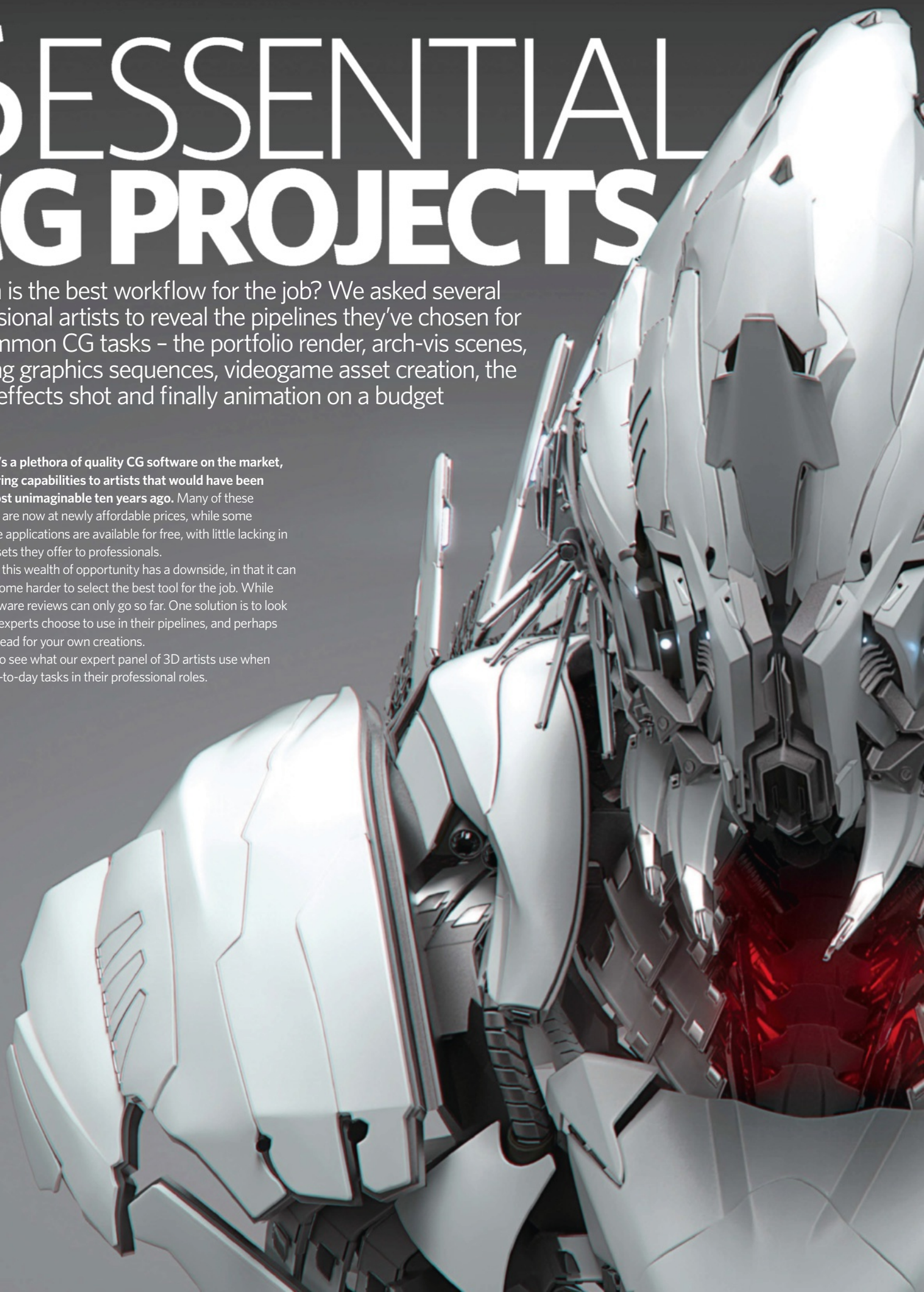
intel inside XEON PHI

+44 (0) 800 180 4801 sales@**wks**mail.com www.**workstation**specialists.com

© Copyright Workstation Specialists – Acecad Software Ltd. E & OE. All rights reserved. Logo & company/product names are trademarks of their respective owners. Intel, the Intel logo, the Intel Inside logo, Xeon, and Intel Xeon Phi are trademarks of Intel Corporation in the U.S. and/or other countries.

6 ESSENTIAL CG PROJECTS

Which is the best workflow for the job? We asked several professional artists to reveal the pipelines they've chosen for six common CG tasks – the portfolio render, arch-vis scenes, opening graphics sequences, videogame asset creation, the visual effects shot and finally animation on a budget



There's a plethora of quality CG software on the market, offering capabilities to artists that would have been almost unimaginable ten years ago. Many of these applications are now at newly affordable prices, while some open-source applications are available for free, with little lacking in the feature sets they offer to professionals.

However, this wealth of opportunity has a downside, in that it can actually become harder to select the best tool for the job. While helpful, software reviews can only go so far. One solution is to look at what the experts choose to use in their pipelines, and perhaps follow their lead for your own creations.

Read on to see what our expert panel of 3D artists use when tackling day-to-day tasks in their professional roles.

// MOST OF THE TIME I USE THE MAYA, ZBRUSH, PHOTOSHOP TRIO, BUT I SWITCH TO OTHER SOFTWARE IF I THINK THEY CAN DO A BETTER JOB //

PETER BARA, 3D GENERALIST

INTERVIEWEES

Jonathan Avila

Title Animator at Ironbelly Studios, **www.ironbellystudios.com**

Location Turlock, California, USA

Bio Graduating with a BFA in 3D animation from Academy of Art University in San Francisco, Jonathan Avila (**www.javila3D.com**) went freelance to start building his experience. He works on phone games, virtual interactive rides for Disney theme park and video games released on Steam.

Hasan Bajramovic

Title CG character artist, **www.hasanbajramovic.com**

Location Sarajevo, Bosnia and Herzegovina

Bio 29-year old Hasan mostly carries out freelance work, specialising in high-detail character modelling for games and film. He has been working in this field for the past five years: "So far it's been a fun ride!" he tells us.

Peter Bara

Title 3D generalist, **www.peterbara.com**

Location London

Bio Peter is a self-taught 3D generalist and traditional artist who is currently attempting to break in to the game or VFX industry. He is capable with a range of software, and is able to easily adapt to new ideas and can jump between styles, while always striving for quality.

Diarmid Harrison-Murray

Title Head of 3D, Commercials, Framestore, **www.framestore.com**

Location London

Bio Diarmid began his career as a digital retoucher of photography, but then went on to study various CGI packages including Maya, Houdini and RenderMan. In 2006, he joined Framestore as technical director and was subsequently promoted to Head of 3D in 2009.

David Houston

Title Senior 3D artist (Soluis Group), **www.soluis.com**

Location Glasgow

Bio A senior 3D artist specialising in architecture & product design, Houston currently manages a team of skilled artists and assists in overseeing the quality control of all work produced by the 50 staff at Soluis studio, including CG content, motion graphics and real-time development apps.

Ben Simonds

Title Director of Gecko Animation, **www.geckoanimation.com**

Location London

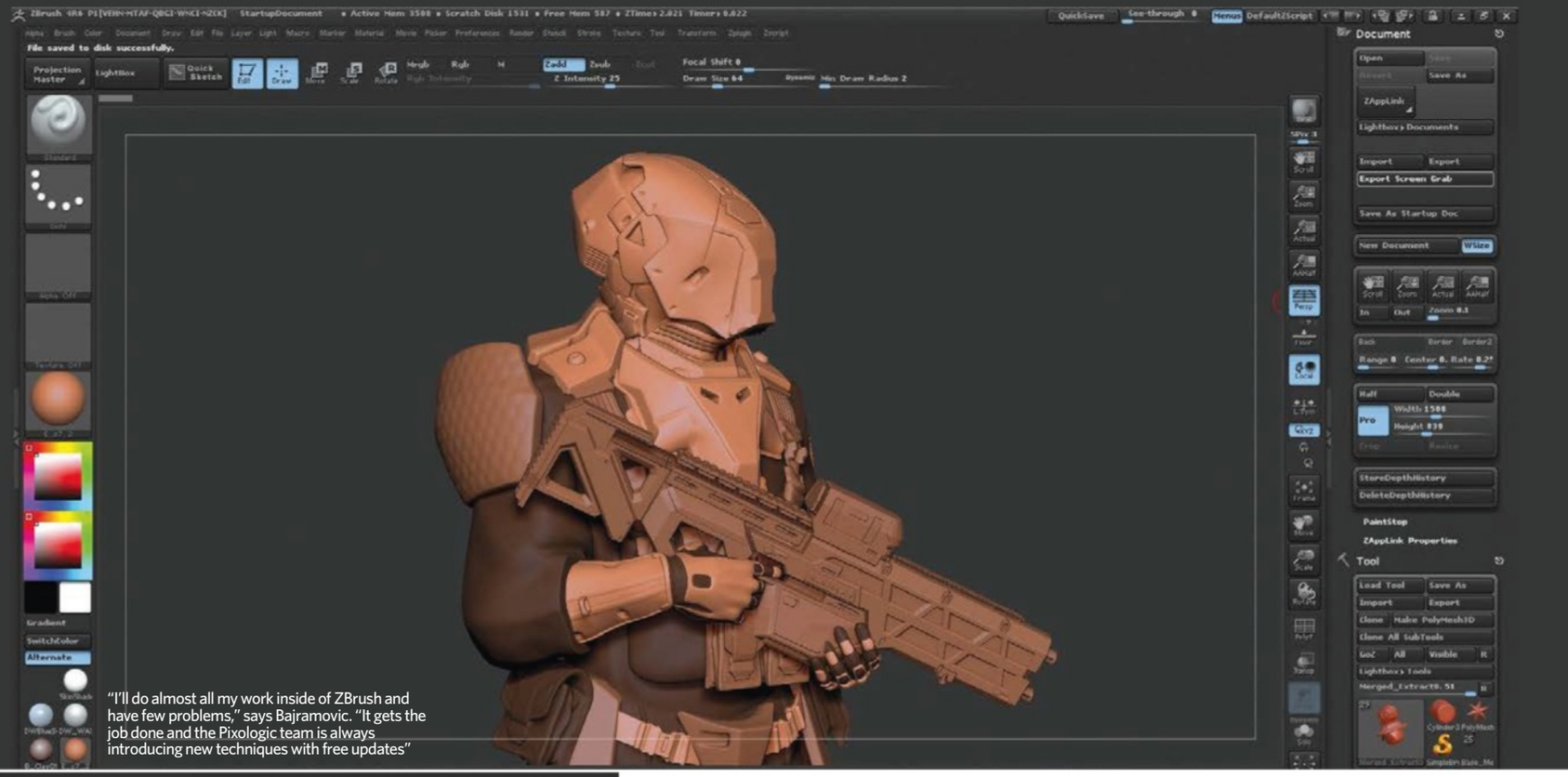
Bio Ben Simonds and his fellow Gecko Animation director, Jonathan Lax, produce visual effects, models, animation, and graphics for television and advertising. Their work has appeared on major UK television channels such as the BBC, Channel 4 and Dave.

Luca Zappala

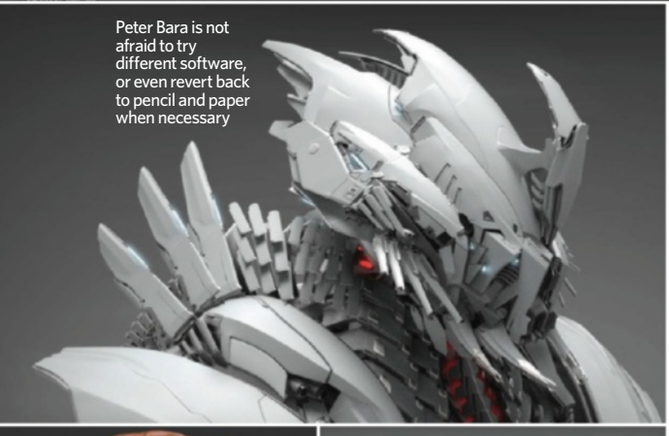
Title Senior technical director, **www.lucavfx.com**

Location London

Bio Luca graduated with a BFA in 3D animation. He used his first 3D software aged 15, attending a 3D course of the National Academy and Design centre of Montreal. His career began as a generalist in the games industry following a move to London in 2011. He switched to films in 2006.



"I'll do almost all my work inside of ZBrush and have few problems," says Bajramovic. "It gets the job done and the Pixologic team is always introducing new techniques with free updates"



Peter Bara is not afraid to try different software, or even revert back to pencil and paper when necessary

1 CONCEPT & CREATE A CHARACTER FOR YOUR PORTFOLIO

When it comes to creating impressive portfolio-ready renders, CG character artist Hasan Bajramovic truly knows his stuff. "For sketching out ideas, a piece of paper will do the job, but when going digital I use Autodesk Sketchbook on my Microsoft Surface Pro," he tells us. "Once I have all the ideas and references ready, I'll start working on ZBrush doodles and develop them more from there. I won't bother with topology until I'm satisfied with the look.

"From there it's pretty much a back-and-forth process, where I try to build out a good core image," he continues. "Once I'm happy with the sculpt, I'll make the topology and do some polypainting to develop the colour scheme and all the textures. From there I export all the models with their textures, importing them either into 3ds Max or Maya and developing the materials and lighting. For rendering I'm currently using V-Ray and a scanline rendering when I need to create quick passes. Remember that retouching your work in Photoshop or any compositing app is not a crime," he adds.

Bajramovic uses ZBrush in both his sketching and detail sculpting stages. "ZBrush is really a big part of my pipeline and with constant free updates, the Pixologic team is always introducing new techniques for easier creation," he explains. "I will also do all of the texturing inside ZBrush and perhaps then tweak some of the textures inside Photoshop. For additional modelling and scene setup I tend to stick with Maya and 3ds Max, however, XSI, Blender and any other software can do the job equally well.

"I prefer the poly modelling tools in 3ds Max over Maya, but I prefer rendering and shading in Maya over 3ds Max," continues Bajramovic. "It's all about finding a faster and easier way to do something. Autodesk has a really cool way of sending files between all of its 3D packages. You just hit the Send Scene To button and you're done. ZBrush's GOZ is also a great way of sending files from ZBrush to most of the 3D apps. Even so, I still prefer to export a standard OBJ file."

For Peter Bara, a 3D generalist and freelancer currently living in London, the tools remain largely the same, but with some slight changes here and there. "Most of the time I use the usual Maya, ZBrush, Photoshop trio, but I constantly switch to other available software if I think they can do a better job," he tells us. "Plus, let's not forget that nothing beats the classic pencil and paper!"

ZBrush and Photoshop are no brainers for Bara thanks to their versatility and power. However, Maya is a personal, rather than an objective, choice. "I wouldn't say that Maya is the best software for modelling – for me that title should go to 3ds Max," he explains. "I just grew fond of the Maya UI and workflow. For those who stick with Maya... writing or collecting custom modelling tools and scripts will save you a ton of time."

In terms of portfolio tips and techniques, Bara is all about lighting. "Lighting can make or break any scene," he explains. "During lighting setup I often change the materials of the model to simple Phong shading with bright specular highlights. This way I can do quick preview renders while moving around the lights, and work on the balance and flow of the light and dark areas. If you are rendering a character, make sure there is a highlight on the eyes, perhaps by using a tiny amount of self-illumination on the iris using the colour texture. This helps a portfolio image really stand out."

TECHNICAL TIPS By Hasan Bajramovic

- Keep your scene and all the files within it organised and clean. Find a good naming convention and folder structure that works for you, as this really helps as your project grows.
- Try to optimise your scene and all the external files as you progress. We can all learn a little something from how the videogames industry works!
- Always keep a back-up of your project. I keep two back-ups – one locally on an external NAS and another on the cloud.

How long does it take to complete portfolio-ready render?
It all depends on the complexity of the image you're creating. If I'm creating an image that's complex and has realistic elements, it would usually take between three to five weeks to create everything from scratch. I don't really like to rush my personal work because I'm mostly working on it in my free time after work and at the same time I'm always looking to learn and improve.

Key software ZBrush, 3ds Max/Maya/XSI/MODO, Photoshop, xNomal, NDo2, V-Ray

2 CREATE AN ARCH-VIS SCENE

Each arch-vis project at Glasgow-based Soluis Group is typically spilt into three digital components: pre-production, rendering and post-production. "These three stages cover every aspect required in creating a scene, from concept to final delivery," says senior visualisation specialist David Houston.

For the initial stages of pre-production Houston will use AutoCad to dilute the information supplied by the client. "This allows me to template a basic model which I can use to get my viewpoints signed off early," explains Houston. "More often than not clients will supply a model, either in Revit format or if it is still in the early design stages a SketchUp model. SketchUp models tend to require a lot of remodelling before they can be usable.

"The pre-production stage is where you really get to put your stamp on a piece of work, especially if it's an abstract piece that requires a lot of painting," he continues. "My primary choice of image-editing software is Photoshop but throughout the process I may also take the project into Photoshop Lightroom and After Effects to achieve a specific style before I have a final result."

While the majority of Houston's modelling work is completed using 3ds Max, some projects require varied alternatives. "I may call upon different software for specific elements, such as Rhino for surface modelling or Marvelous Designer for things like fabric creation."

Most of the applications Soluis uses integrate well. "Information provided by a client, whether it be in DWG format, a SketchUp or a Revit model, will translate into 3ds Max as long as the data was set up correctly in the first place," says Houston. "Poor modelling at the early stages can become highly problematic later on when a project gets to the render stage. I prefer to render out my V-Ray elements as HDRs. This allows for perfect integration with both Photoshop and After Effects to initially balance the exposure in a 32bit workflow."

For architectural rendering Houston has always used V-Ray, while for industrial design images he tends to opt for KeyShot. He believes that if you choose to switch between rendering engines you must be prepared to redo a lot of groundwork. "V-Ray Cameras, V-RayProxy objects and also V-Ray lights are only supported by V-Ray," he explains. "If you wish to switch to say mental ray or Octane Render you will have to set up new lighting or materials. If you have the option to choose between engines it is best to commit to one at the start of a project and stick with it."

TECHNICAL TIPS By David Houston

- Test your scene. This includes look and feel, rendering stability and also render time. This is especially important if you use cloud rendering for your final product. If your scene is not optimised then your whole project can become very expensive. A lot of third-party model companies set the material parameters quite high for things like reflections and translucency when they don't need to be. In some instances this can triple your render times.
- Take advantage of third-party plug-ins and scripts to speed up your workflow. Script Spot **(www.scriptspot.com)** is the perfect website to explore scripts that can enhance your scenes, speed up your modelling and enable you to integrate assets that you may not have been aware of.
- Keep your modelling clean and your scenes well structured. A good naming convention will work wonders if, for example, the day before delivery your client calls you to say 'The building footprint has changed, that won't take too long to alter will it?' In reality it probably will regardless, but if your layers or groups are well organised it will be much easier.

How long does it take to complete an arch-vis project?
This is one of those 'how long is a piece of string' questions. It all depends. The timescales are generally dictated by the size of the scene and the level of detail the artist is prepared to go into. If it's a commercial work, the deadline will be dictated by the client. Additionally, for commercial projects, you will be expected to issue interim drafts before the final project is completed.

Key software 3ds Max, MODO, Maya, Blender, SketchUp (Modelling), V-Ray, mental ray, Maxwell Render, Arion, Corona Render (Rendering), Photoshop, After Effects, Fusion, Lightroom (post-production)

3ds Max has always been at the forefront of David Houston's modelling pipeline due to its significant performance for architectural visualisation

Arch-vis projects can differ greatly in style and theme, meaning varied tools can be required
Image courtesy of Soluis Group

6 essential CG projects

3 COMPLETE A PROJECT WITHOUT SPENDING A PENNY

Ben Simonds and Jonathan Lax are 3D artists and directors at the London-based Gecko Animation, which uses Blender for almost its whole pipeline. "We do all our modelling, animation and rendering in Blender and usually our compositing too," explains Simonds. "We use its motion tracking tools for VFX work, and the simulation tools. We also use GIMP for painting textures."

A typical project at Gecko starts with a treatment of the general project concept, which is discussed with the client, followed by a basic storyboard on pen and paper. "With this as a plan, we'll start on an animatic, or if it's a smaller project we'll start work on the animation itself," explains Simonds, who reveals that this animatic slowly develops into the final version. "We keep going back and replacing assets and animations. Our final renders are then done either in-house or sent off to a render farm depending on how complex the scene is."

Simonds feels that Blender is a terrific tool for small studios. "Obviously it's free, which is a tremendous start, but it's also hugely versatile," he explains. "Both the interface and the back-end of Blender are well suited to a pipeline where we can go back and change things as the project progresses. You aren't stuck moving from one stage to the next and not being able to go back. We need to be flexible about what we're working on at any given time. The Python API for Blender makes it customisable and we can write scripts to automate simple tasks to speed up our work."

> **// BOTH THE INTERFACE AND THE BACKEND OF BLENDER ARE REALLY WELL SUITED TO A PIPELINE WHERE WE CAN GO BACK AND CHANGE THINGS AS THE PROJECT PROGRESSES //**
> **BEN SIMONDS,** GECKO

On the rendering side, Simonds praises Blender's Cycles engine. "It produces really nice renders and gives a realtime preview for working with lights and seeing what renders will look like. However, we still use the older Blender Internal renderer for quick results on simple renders."

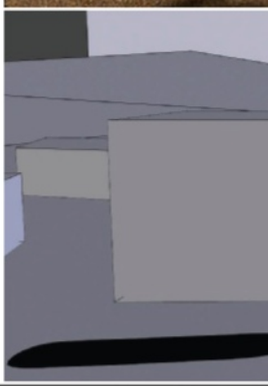
Sticking mainly to one app has the advantage that there isn't much handover of files. "In Blender we pull together assets from multiple files, but Blender's file structure lets you do this natively without exporting to another file type first," says Simonds. "Any asset is assigned to a datablock that you can append into any other file."

TECHNICAL TIPS
By Ben Simonds

- Make sure you name all your objects, materials and textures properly. It's always a big time-saver when/if something goes wrong if everything in your scene is named helpfully rather than being called 'Cube.001', 'Plane.017' and so on.
- Set out a new file structure at the start of your project. Create separate directories for your scene files, textures, renders, reference and so on. This will help a lot with keeping your project manageable. It's also helpful for keeping your files together if you need to move your project.
- Render frames, not videos. Blender will let you render directly to video files, but don't do it! If there's something wrong with your scene or a frame drops, at least you can salvage those frames that worked if you rendered to individual frames. If you rendered to a video file that's a whole useless file that you have to re-render.

How long does it take to complete a Blender project?
It obviously varies, but for the Royal Institute Lectures project it took us around three weeks in total, doing look development, a quick animatic, modelling, animation and rendering. Our other projects typically fall in the same range, from perhaps a couple of weeks to a month and a half. We primarily make shorter videos though, ranging from 30 to 90 seconds.

Key open-source software
Blender and GIMP! You can expand that list a lot, especially if you want to add and work with sound, but you can get pretty far with just those two.



Textures for Tessie were created in Photoshop and modelling was carried out in 3ds Max. The animated section of Tessie's pipeline took place in Maya

4 BUILD A HERO VIDEOGAME ASSET AND ANIMATION

Jonathan Avila was working at Ironbelly Studios when he was given the job of animating Tessie, one of the playable characters in the upcoming multiplayer game *Jeklynn Heights* by Vex Studios.

"Character design starts with an idea," explains Avila, explaining that it's then the job of the concept artist to take that idea and draw several versions to develop the best representation and style. The more various the versions produced at this stage, the better. "This concept is then passed on over to the 3D modeller, who takes the approved concept art and creates the character in 3D, usually using 3ds Max."

"After the model gets approval it's sent over to the texture artist, who uses Photoshop to create the UV maps for the character," continues Avila. "For 2D image textures we use either JPG or PNG files which work really well and keep the file size pretty low.

Blender's Cycles render preview. Simonds praises the new Cycles renderer for its realtime preview, which allows for a faster turnaround of shots

A Blender blocking in/animatic by Gecko Animation for BBC 4's *The Royal Institution Christmas Lectures*

"Once that's finished and once again approved, the 3D model and texture file is sent over to the Rigger who builds a skeleton to fit the character body structure," says Avila. "The rigger then adds special controls that allow you to push, pull and move around this skeleton."

When rigging, Avila predominantly uses Maya. "I love the tools it has to offer when creating the bones and controls to tweak the rig," he says. "3ds Max has a really nice pre-made rig tool that allows you to whip out biped characters really fast. However, in my opinion, Maya is the way to go when it comes to creating rigs from the ground up."

Once rigging is complete he skins the 3D model of the character to the rig by painting weights. "Painting weights is when the rigger sets which vertices are to be influenced by which bones in the rig," explains Avila. "Once this is done you have a fully rigged character with a really cool texture and controls that allow you to move it around."

Maya is also used for animation. "Maya's animation graph editor is simply amazing," explains Avila. "75 per cent of animating is done in the graph editor so it's pretty important to use a program that complements that process."

Finally the animator takes the rigged character and creates a list of actions. "This is called the Animation List," explains Avila. "This list is based on the types of things the designer wants the character to end up doing in the game, such as run, jump, crawl and so on. Each animation normally gets tweaked a few times before it is finally approved. Once that is done it's passed to the programmer, who then puts it all into the game engine using FBX."

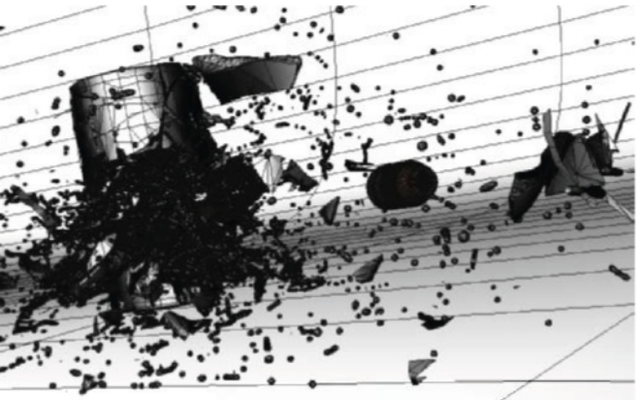
// MAYA IS THE WAY TO GO WHEN IT COMES TO CREATING RIGS FROM THE GROUND UP //
JONATHAN AVILA, IRONBELLY

TECHNICAL TIPS **By Jonathan Avila**

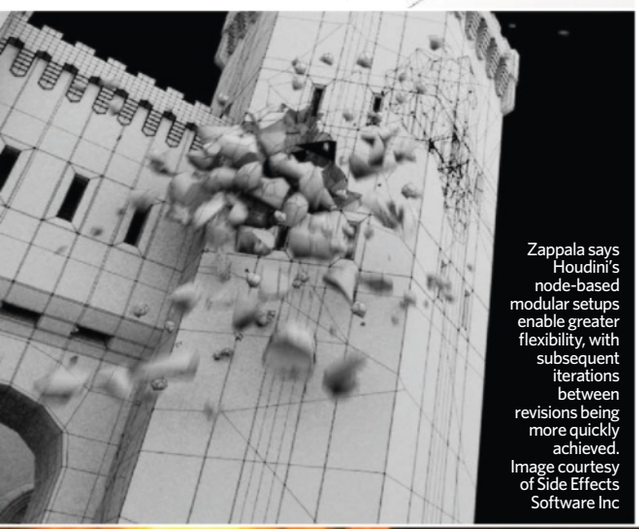
- If you're thinking about using changeable clothes on an animated character, be sure to have extra room between the mesh of the character and his piece of clothing. When 3D modellers create the meshes, they set it up look really good in that one default T pose, but once they hand it off to the rigger and animator it starts bending and twisting clipping issues can start to occur.
- Always send assets around and make sure everything has the correct proportions and sizes. You would be surprised how often this can cause delays in completing assets, if for instance one person models a character and the other the weapon and they simply aren't proportional to one another.
- Optimisation is key. In coding you worry about draw calls, in modelling you worry about your poly count, in rigging you worry about how many bones you can use and how many bones are allowed to influence each vertex. They're all connected, so discuss it with your team. For example, the modeller might need to know the bone limit is low, so they can better design the geometry of the character to allow for more polys in areas needed for bending.

How long does it take to complete an arch-vis project?
From start to finish, meaning from the concept art to the asset being rigged with a basic idle animation in the game, it can take around two to seven days, depending on how complex the model and rig are.

Key software Maya, 3ds Max, Photoshop
Affordable game engines Unity, Hero, GameSalad



Although Maya is the standard tool for film VFX, use of Houdini has been growing drastically. Image courtesy of Side Effects Software Inc



Zappala says Houdini's node-based modular setups enable greater flexibility, with subsequent iterations between revisions being more quickly achieved. Image courtesy of Side Effects Software Inc

TECHNICAL TIPS

By Luca Zappala

- You should never underestimate how long things take to create and should always allocate more time than you might expect to use, to accommodate factors beyond your control. These always need to be accounted for and they can include anything from a busy render farm to technical issues, IT problems, power outages and so on.
- You should always try to get your work approved in stages, so you can get parts of your setups locked down and then move on to secondary elements and refine them whenever possible. This will provide the time to add those extra touches that really help to sell the shot.
- It may sound obvious, but you should be very organised. Stick to your naming conventions and keep your setups tidy and well-maintained between separate shots. Also, try not to cut corners, as this often comes back to bite you!

How long does it take to create a visual effects shot?

Creating a visual effects shot from start to finish can take anything from a few days to the duration of the whole project. It also depends on budget, complexity and client expectations. Bigger shots can take several months whereas smaller more straightforward shots usually take between one and three weeks.

Key software Maya, Houdini, NUKE and a good image sequence viewer such as RV

Zappala says Houdini is widely used for simulation and dynamics in film VFX, but it's increasingly being used for lighting and rendering thanks to Mantra Image courtesy of Side Effects Software Inc

5 CREATE A VISUAL EFFECTS SHOT

For senior technical director Luca Zappala, building a destructive VFX sequence will start with a look development phase, which includes research and development and setup creation. "One shot is usually selected, and external and internal briefings with corresponding references are provided, or suggested as the look is built," he explains. "This is the most important phase of the project and is a production-wide effort to please the client and lock the look."

Initially the geometry is pre-shattered, ensuring that the features from the original geometry are kept as they were. "Depending on complexity and the time that is available, dynamic shattering is used in order to let the simulation solver shatter existing chunks into smaller chunks. However it is preferred to build more robust setups where primary simulations feed into secondary smaller simulations for choreography reasons."

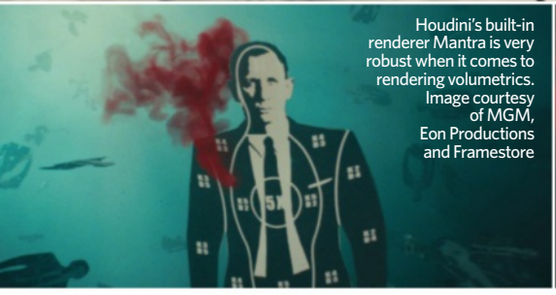
In terms of tools for the pipeline, Zappala says that Maya is extremely intuitive and very solid for quick, effective results, especially for assets, animation, cameras, lighting and rendering. However, Houdini has largely taken over in areas such as effects simulation and dynamics. "It's now starting to be used more for lighting and rendering as well, thanks to PBR and Mantra, Houdini's integrated rendering solution," he says. "Regarding destruction and effects work, Houdini is very good at manipulating data. It is also very good at quick reiterations."

As an interchange file format, Zappala says Alembic is becoming the standard, due to its integration with Maya and Houdini.

As soon as the main bulk of the effect is half-approved, secondary refining steps are simulated. Zappala explains: "Where possible, recycling caches and sims from similar shots is encouraged, especially for quick or simpler shots. Textures and shaders are usually handed over, while for smaller debris and fluids it is usually up to the FX technical director to light and render his/her elements. For bigger, more complex assets it is possible for these to be handed back to the Lighting department."

The result of the simulations, whether animated shattered geometry or fluid simulations or particles, are then rendered and passed to the compositors. However, the VFX team start providing renders quite early on in the process. "The idea is to try and render as many separate elements as possible in order to aid the compositing stage," says Zappala. "Additional bespoke secondary channels or indeed renders might be requested or defined along the way, so it's often the case that the number of renders for each shot will grow until final comp delivery."

Harrison-Murray took lead as CG Supervisor on the *Skyfall* opening, overseeing a pipeline that included Houdini, Maya, NUKE and HEIRO. Image courtesy of MGM, Eon Productions and Framestore



Houdini's built-in renderer Mantra is very robust when it comes to rendering volumetrics. Image courtesy of MGM, Eon Productions and Framestore

6 DEVELOP AN EXCITING GRAPHICS SEQUENCE

Do opening graphics sequences get more exciting than the intro to a *James Bond* movie? The first stage of creating the dramatic title sequence to *Skyfall* saw Framestore running some tests in 2D and 3D, inspired by mood artwork created by the director of the title sequence, Daniel Kleinman. This was followed by The Third Floor, Framestore's partner company, creating a previs of the whole title sequence. This informed both the extensive live action shoot and the CG work. The latter relied heavily on Houdini.

"Early in the project Houdini worked well for prototyping ideas," explains Diarmid Harrison-Murray, head of 3D in the commercials department. "We could quickly explore variants on a theme or creative ideas in our tests and experiments.

"Houdini was used for all the 3D work, with the exception of the vault sequence, the gun barrel, and some of the modelling and textures," he continues. "All the vault scenes were done in Maya, solely because the artist I thought best suited to handle those scenes creatively works that way."

"Houdini's procedural workflow meant that we could accommodate changes to the brief and edit throughout the schedule," continues Harrison-Murray. "Also the easy access that Houdini gives you to all the data in the scene meant that we could manage, debug, and optimise our often heavy and complex scenes with relative ease."

The other plus for Houdini was its built-in renderer, Mantra. "We knew that we could rely on it to not choke when it came to rendering all of the fully CG content at film resolution. Many of the scenes have a lot of volumes and fluids to render, and Mantra is really strong when it comes to rendering volumetrics. We ended up using its physically based rendering mode, which gave great shading results, and its stochastic transparency sampling gave us great control of quality versus speed when sampling all the volumetric data."

Different parts of the sequence developed at varying speeds. "One scene could look great while its neighbouring sequences were checkerboards and proxy content, but once these developed further we'd realise the more polished-looking sequence hadn't been right," he recalls.

Framestore relied on an in-house format for interchange of geometry caches, hierarchical caches and cameras between Houdini, Maya and compositing tool NUKE.

"NUKE was the obvious choice of 2D software for the project," says Harrison-Murray. "It offers a great workflow when compositing heavy, high-dynamic-range CG renders, and its 3D capabilities were core to the work done on this project."

PRE-VIS IN THE PIPELINE

Previsualisation has become an essential part of the pipeline when creating any high-value production, whether its films, commercials or quality television. There are dedicated off-the-shelf applications for previs, such as FrameForge Previz Studio or Storyboard Lite, while Poser and Daz Studio can also be used for character work. Recently, iClone has also revealed itself to be a simple and accessible tool for use in the previs process.

However, studios are increasingly turning to a combo of Autodesk's Maya and MotionBuilder, as well as using NUKE or After Effects for the compositing. As in general VFX, Maya is used for modelling, texturing, effects and animating the previs – and because it's an industry-standard app for visual effects there's no problem when the previs artists hand over assets to the production team. As well as close integration with Maya, MotionBuilder can also import and adapt motion capture data for character performances. It offers realtime control of scenes, so shots can be changed and refined with ease. Maya and MotionBuilder also feature high-quality display viewports that mimic the final output.

Previs doesn't end at the beginning of a pipeline. The cracking mirror scenes in *Skyfall*'s titles were based on a previs sequence in Maya. The image was re-projected in NUKE, and a final scene was built out. Image courtesy of MGM, Eon Productions and Framestore

I made this...

Incredible 3D artists take us behind their artwork

Artist info

Zhi Peng Song

3DArtistOnline

Username: song861228

Website www.song861228.cgsociety.org/gallery

Country China

Software used 3ds Max, Maya, Mudbox, Photoshop, V-Ray, ZBrush

Next, Please 2013

I always love to create interesting, crazy stuff with CG that people are unable to see in everyday life. The five bad guys you see here include masked robbers, mad butchers, escaped prisoners and even a one-eyed pirate captain.

> At first, I used Maya to create a basic model and ZBrush to sculpt detail, then Mudbox and Photoshop for texturing. Lighting, material, hair and rendering were done with 3ds Max and V-Ray, while the composition was created with Photoshop

Learn how to

- Hi-res sculpt
- Texture
- Create hair
- Build eyes
- Set up a V-Ray shader

With the Disc

Tutorial files:

- Tutorial screenshots

Concept

I didn't use any concepts but rather relied on real-world reference that I gathered as inspiration and visual aid to create my final artwork.

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

Dan Roarty

3DArtistonline

Username: droarty

Personal portfolio site www.danroarty.com

Location Redwood City, CA, USA

Software used Maya, Mudbox, V-Ray, Shave and a Haircut, Photoshop, Knald

Expertise An artist specialising in realistic 3D heads and portraits

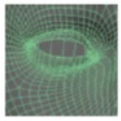
Ultimate human realism

Freckles in a Blanket 2013

"This image is a realistic portrait of a girl wrapping herself in a blanket, looking into the camera at the viewer"

Dan Roarty is a lead-character artist at Crystal Dynamics/Square Enix

Over the next few pages I'll outline the steps and techniques I used to create this image for *3D Artist* magazine and its readers. First, we'll gather some reference and define the project to ensure a quicker and more organised workflow. We'll cover modelling in Maya, as well as sculpting and texturing within Mudbox using stencils and projections. I'll introduce a free piece of scanning software I used on my phone for capturing 3D data and using it in the final image. We'll cover creating and styling hair using Shave and a Haircut and the workflow for converting to Maya Hair. I'll also show you how I created the eyes and the texture used. When we have everything modelled and textured we'll create realistic V-Ray shaders for the skin, hair and eyes, and I'll show you the lighting setup and render settings I used for the final piece.

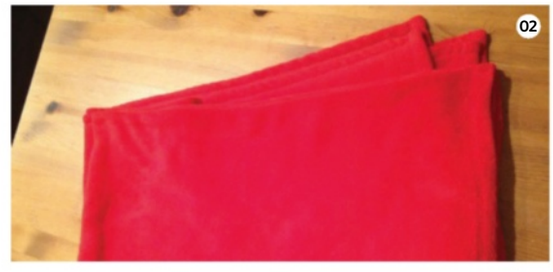


Define your concept

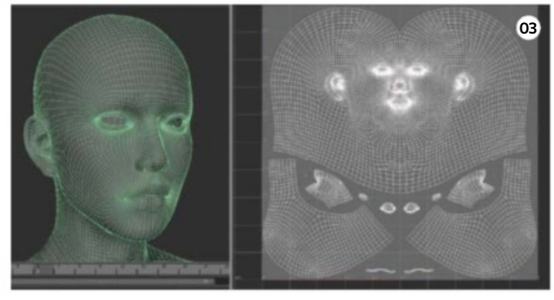
The level of planning you do can make or break your project

01 Decide on an idea When working on their own projects, some 3D artists have a tendency to create a concept on the fly, rather than spending quality time deciding or defining exactly what the final image will look like. Without a clear goal, it's impossible to know what assets need to be created and when. At times this can lead to incomplete projects and/or an unrefined final image due to lack of planning. With this in mind, I decided to create a realistic red-headed female wrapped in a red blanket and looking into the camera. Thanks to this process I knew which assets I needed, such as a face, hair, eyelashes and blanket. So, with the idea defined, let's gather some reference in order to better guide us through the process.

02 Gather reference I gathered a lot of online references for hair colours, facial expressions and specific poses of the face that looked appealing. I didn't intend for my model to fully match the references I found, but set out to use them as inspiration and a general guideline to follow. Another big reference and help for me was my wife. I took a few photos of her looking into the camera as a reference of the general look and angle that I wanted to achieve. It was also very helpful to see how the blanket would look in the picture and how I wanted to make it.



03 Block out meshes and UVs With your reference gathered, start blocking out the base meshes in Maya prior to sculpting. I had a basic head mesh that I had previously created, which I am able to reuse when creating a new project. I spent time ensuring that the head reacted well to sculpting and also deformed properly when adding facial expressions. Now lay out the UVs to ensure no overlapping and proper distribution of UV space among the polygons. You can test how the UVs respond by applying a basic checker texture in Maya. We can worry about creating the blanket later on, as we'll be creating it using a 3D scanning approach. With your head mesh ready with UVs, let's export that and the blocked-out blanket geo as an OBJ to bring into Mudbox.



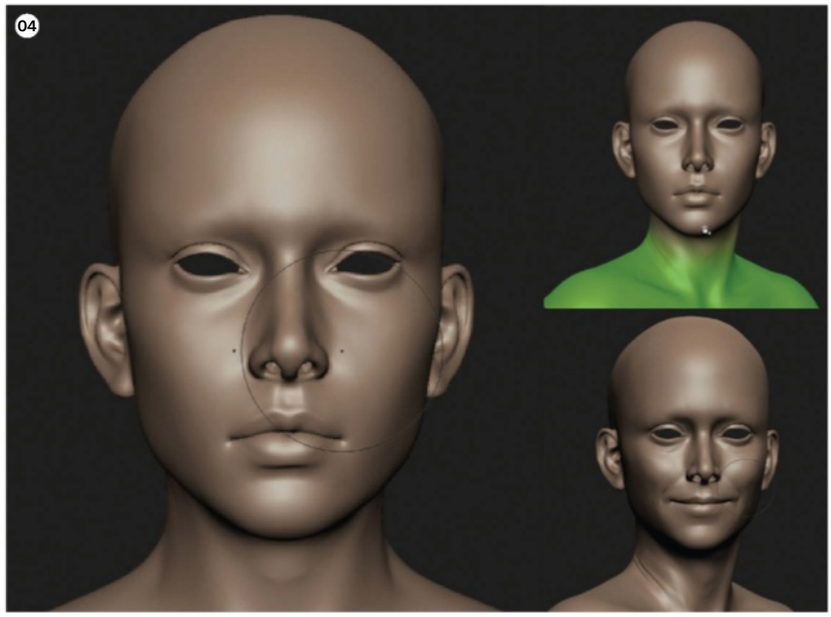
Break it down to bite-size pieces

It took me quite a bit of time to build a head I was happy with and with nice UVs. Don't feel pressured to rush into creating a large, complete project right away. At times, I think 3D artists take on far too much as a first project, and end up sacrificing quality in order to complete a piece. Begin small and work on easier projects while concentrating on fundamentals. Practise anatomy and hone in on your skills in between bigger projects.

Sculpt the head in Mudbox

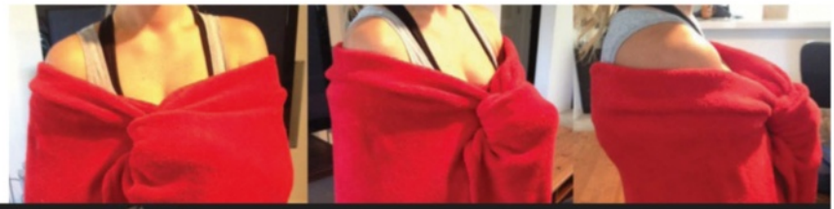
Start forming and texturing the head

04 Add expression and pose With our base head exported, open it up in Mudbox. I spent quite a bit of time ensuring all the proportions of the face were correct and looked at as much reference as possible. As we're creating this character from the imagination, it will be important to ensure it looks natural and all proportions are accurate. Get the face in a proper neutral state where the expression is blank but natural when looking ahead. Place a bone in Mudbox on a sculpt layer, rotate the head to the angle that matches the reference and continue refining the shape. Add the expression you want to convey in the face, largely using the Grab and Sculpt brushes. At this stage we're ready to add all the pores and wrinkles.



05 Create pores and wrinkles When creating the pores and fine wrinkles, we will need to subdivide the model to a high enough division to accept the sculpting information. I subdivided mine up by five. Next, create a layer called Pores and select the Pores stencil that comes with the Stencil brush in Mudbox. From here you can use the Sculpt brush and start applying it to the entire head. With the pores complete, create a new layer called Wrinkles and, using the Knife brush, start defining the lips, the areas under the eyes and other areas that may have visible wrinkles. For the final touch, make a Bumps layer and use more of the provided stencils in Mudbox, applying each to the model to get the look we're aiming for.

06 Scan and retopologise the blanket For my blanket I wanted to try something new, so I used the free 123D Catch software by Autodesk on my smartphone. I asked my wife to wrap the blanket around her in the proper pose, and I used the software to capture 360 degree images of her before using the program to create a very basic 3D mesh. It worked extremely well. From here I retopologised the model, scaled it and further sculpted and manipulated the geometry to fit with my head mesh in Mudbox.

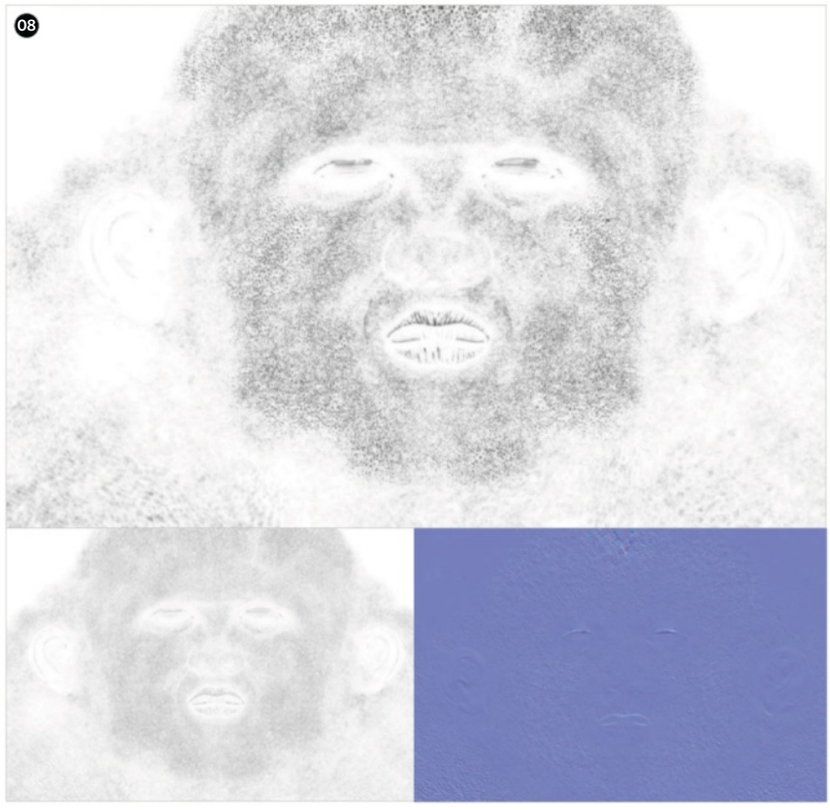


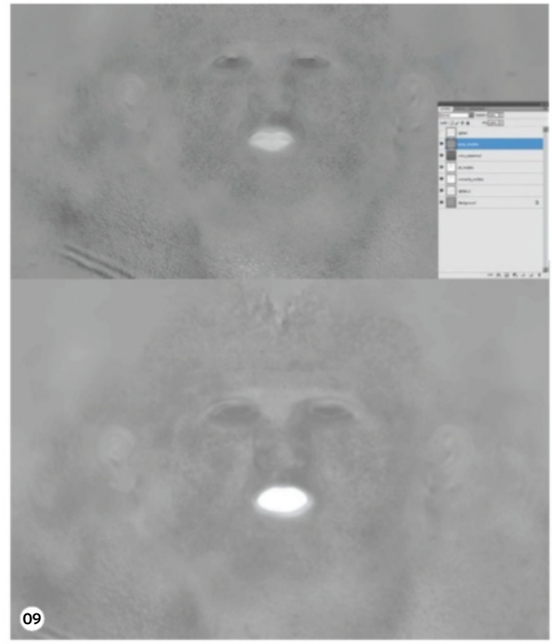
Sculpt back and forth

When sculpting the head in Mudbox it's okay to go back and forth throughout the process. When you're at the rendering stage, you might notice that the shape of the face or expression isn't quite reacting the way you were intending with a skin shader applied. As such, I usually bring my sculpted head into Maya, apply a skin shader and try different lighting conditions to see how natural it feels. If I notice areas in the face that aren't reacting correctly to lights and shadows, this usually means there is further refinement to be made to the expression or shape.

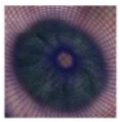
07 Texture the face For texturing I relied on photo reference for projections. I began using the Paint brush and blocking out very basic colours to show where I wanted blush, lip colour and eye shadow present. From there I created new layers and used photos of Oldriska from 3D.sk as texture reference for projecting her skin and freckles. I wasn't too concerned with the top of the head, ears or back of the head, as I knew none of these would show in the final render. I wanted to ensure that the freckles would pop as well, so I used the Burn brush afterwards to really punch them out when it came to rendering. I also projected a faint colour for the eyebrows to use later as a template with Shave and a Haircut. When done, save the finished texture as Colour, bring it into Photoshop and create a slightly desaturated blue with less contrast. Save this out as Subsurface.

08 Use Knald for reflection For my Reflection and Gloss maps I used a newer piece of software called Knald (www.knaldtech.com). Among other features, Knald enables you to take maps and generate them into others. To start, save out a hi-res version of your head from Mudbox and then a lower subdivision (2 or 3 should be fine) without the pores and wrinkles present. Next, use XNormal or Mudbox to extract a normal map at 4,096 x 4,096. With the map baked, let's open Knald and play with the settings so there is enough detail present in the maps. We can then save out both an AO map and a Concavity map at 16-bit TIF format.





09 Complete the Reflection maps Open Photoshop and start to build the Reflection and Gloss maps. First, take your colour texture, desaturate it and bring it in as a new layer. Now import the AO and Concavity maps you exported in the last step and set them both as multipliers on top. I tend not to add too much contrast in these maps as it will not enable the reflection to react to the skin as intended. Next paint on some additional layers for areas such as lips and eyelids to punch the amount of reflection with a higher value and save out the map as the Reflection map. Next, open up a duplicate of the map, blur it and paint dark areas where you'd like to have broader reflection and brighter areas for hotter reflection. Save this out as a Gloss map. Examples of both are provided with this issue.

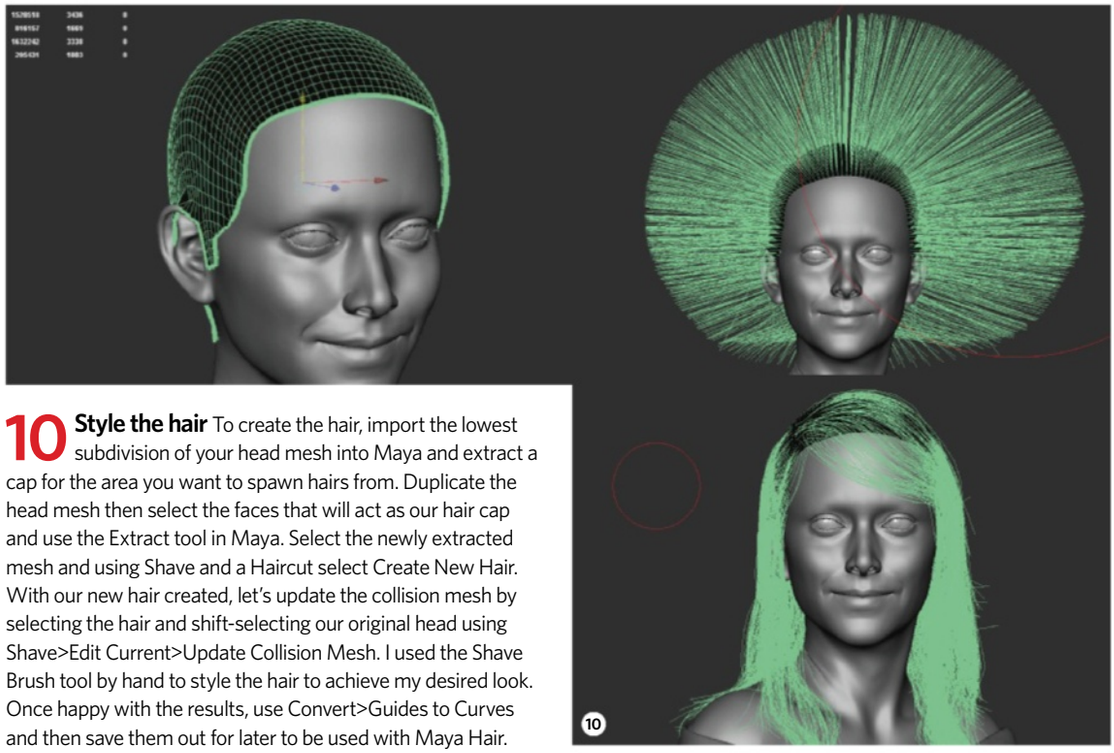


Add realism to the hair and eyes

Create the hair with Shave and a Haircut and the eyes with realistic textures

Styling the hair

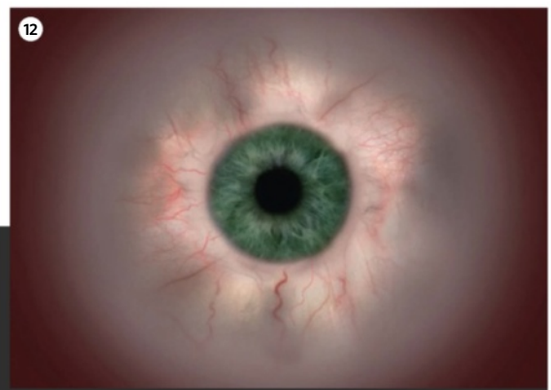
When styling the hair it's important to take your time. I'll occasionally do quick test renders to see how the hairs are clumping together to get an idea of how it may look later on. I created two separate passes of hair for this project – one for the majority of the hair and the other for individual strands that fall in front of her face. By creating additional hair selections you can control them later on with Maya Hair. I tend to turn off the Shave and a Haircut Hair Visibility tab and just focus on the strands, as that's what I will ultimately be using. For the eyelashes I use the same approach as that of the eyebrows.

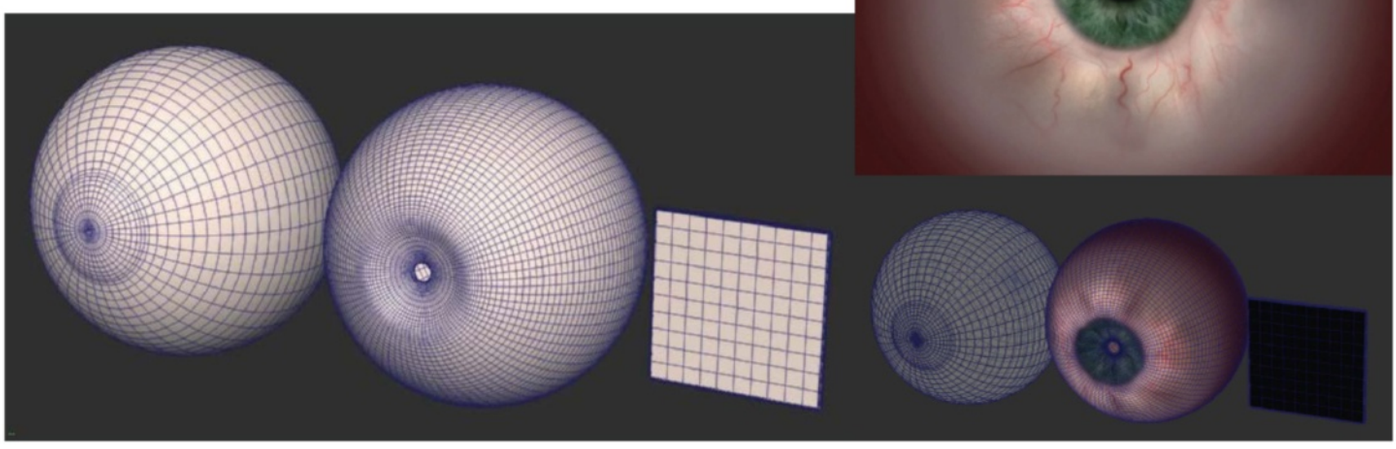


10 Style the hair To create the hair, import the lowest subdivision of your head mesh into Maya and extract a cap for the area you want to spawn hairs from. Duplicate the head mesh then select the faces that will act as our hair cap and use the Extract tool in Maya. Select the newly extracted mesh and using Shave and a Haircut select Create New Hair. With our new hair created, let's update the collision mesh by selecting the hair and shift-selecting our original head using Shave>Edit Current>Update Collision Mesh. I used the Shave Brush tool by hand to style the hair to achieve my desired look. Once happy with the results, use Convert>Guides to Curves and then save them out for later to be used with Maya Hair.

11 Shape the eyebrows For the eyebrows, import your low-res head mesh into a new scene and apply your Colour texture to it to act as a guide for styling the eyebrows. We'll want to create curves to act as our eyebrows later that sit on top of the head mesh. To do this, let's make our head live by selecting it and then the magnet icon in Maya. With our head live, use the EP Curve tool and draw the specific eyebrows you want. Take your time with this and ensure that parts are elevated above the mesh by moving the curves after you've created them. With the adjustments made we can save these out as an eyebrow group for later.

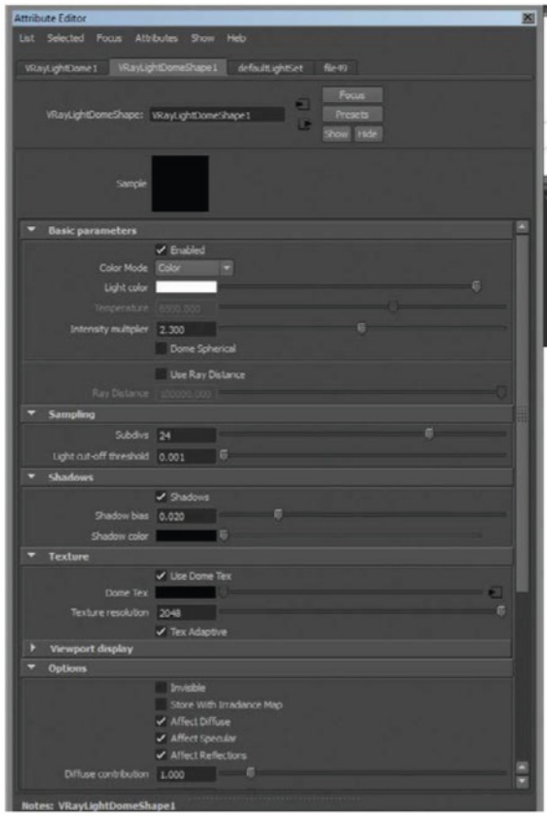
12 Model and texture the eyes When modelling the eyes I use a simple approach that has always worked for me. I break down the eyes into three separate parts: the lens, sclera and pupil. For the lens, I create a sphere and ensure there is a bulge outwards such as in a real eyeball. For the sclera it is a concave sphere with the centre hole cut out for the pupil. The pupil itself is just a standard plane that sits directly behind the sclera and is completely black. The sclera is the only piece that I texture with a colour map that you can find provided with this issue. Next I will show you the specific materials I use.

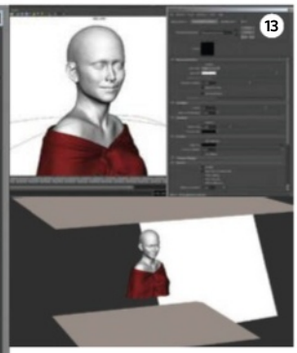




Shaders and lighting

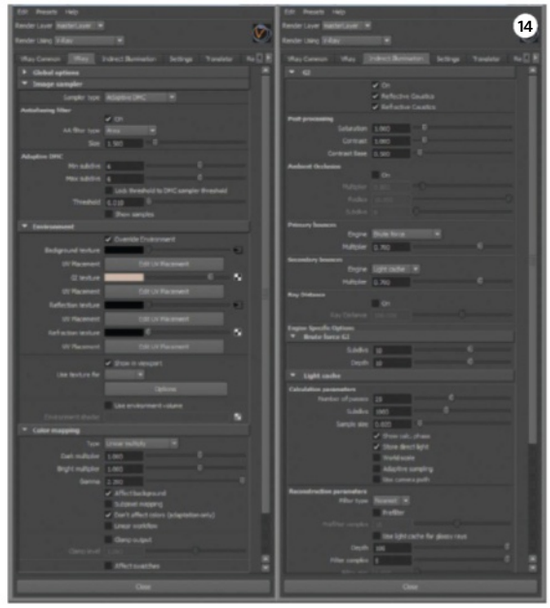
Shader creation for the skin, hair, eyes and lighting



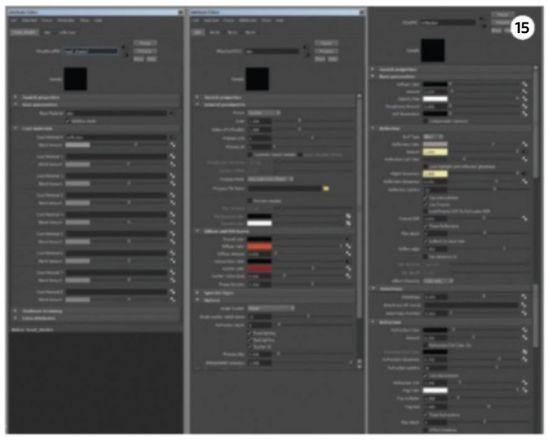


13 Lighting setup Bring in the highest-res OBJs of the head and blanket. Ensure Visible In Reflections and Visible in Refractions is selected for both meshes under your Render Stats Attribute. For lighting create a V-Ray Dome light and select an HDR image to be placed into the Dome Tex slot at maximum res. For my HDR image I used Newport Loft, available for free from **hdrlabs.com**. Set your Subdivs to around 24 for better sampling, and play with Intensity to find what works best for you. Create three basic poly planes and apply a basic lambert of a colour you want to illuminate your mesh. I created an off white colour for mine. Place them in areas where you would like to see some illumination on the character.

14 Render setup Some of the major takeaways for my render settings are my Adaptive DMC settings, each of which I cranked to 6. This makes a huge difference in the quality of my hair rendering. For the Reflection Texture I used the HDR image from my dome light and set the GI Texture to a warm colour rather than texture. For the global illumination ensure it's turned on to take advantage of the planes you created. For Primary Bounce I used Brute Force and for Secondary Bounce I used Light Cache. I used a multipliers setting of .7 but you can experiment.



15 Layered skin shader with reflection For the skin shader, start by creating the layered V-Ray shader VRay Blend Mtl. Create the skin material by selecting a V-Ray Fast SSS2 shader and plugging it in to Base Material. Plug your Colour texture in to the Overall Color slot and your Subsurface texture into the Sub-Surface Color slot. I ended up using a dark red for my scatter colour and changing the Scatter radius to .650 (depending on the size of your head mesh). Next let's create the reflection shader by creating a VRayMtl and slotting it into Coat Material 0. Input your Reflection map into your Amount under reflection, and your Gloss map into your Highlight Glossiness slot. You can see the specific settings I had for my shader in the screenshots supplied with the disc.

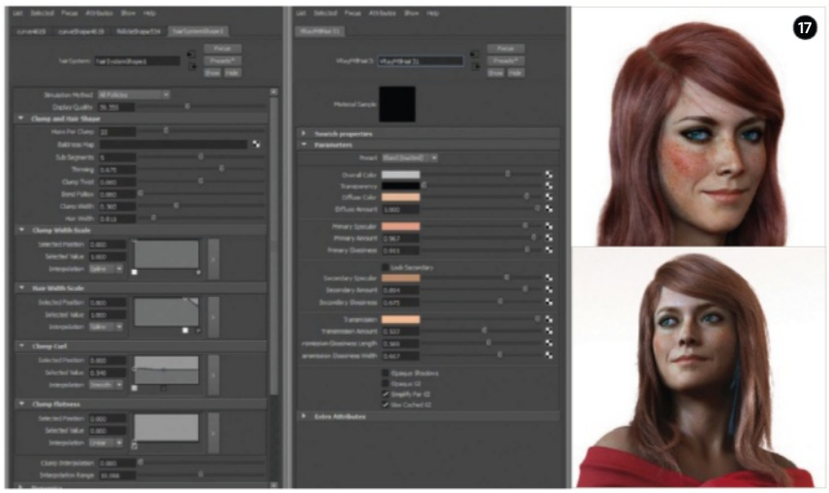


16 Create the eye shader For my eye shader I created a VRayMtl for my lens mesh and a VRayFastSSS2 for my sclera. I want my lens to have only reflection and refraction and my sclera to have a bit of subsurface scattering. I turned my Reflection Color on the lens to just above black and set the amount at .740. Adjust both depending on the amount of reflection you want in your final image. I turned Refraction Color to white and set it to 1.0. Refraction IOR was best set to 1.60. I also had a slight fractal bump map on my lens but it was barely noticeable. For my sclera I put my eye texture into the Overall Color.

Render and composite

Add the final elements and bring the image together

17 The hair shader When rendering the hair I found it best to take the curves we created earlier and apply them to a Maya Hair system. First let's create our hair system by creating a basic polygon cube and selecting Hair>Create Hair. Next, select your curves group and go to Hair>Assign Hair System>hairSystemShape1. This will apply your hair system to your hair curves. Play with the specific settings for how you want the hair to look. To select a V-Ray Hair shader, select your hair system, go to the top and select Attributes>V-Ray>Hair Shader. Now select VRayMtlHair3. You can see the settings used in the screenshots supplied with the issue.



Don't forget the lashes and brows

A couple of things I haven't touched on are the eyelashes and the eyebrows. For the eyebrows I used the same method for creating the hair. I started with the curves, created a new hair system and then applied it. For the shader, I relied on a duplicate of the hair shader with darker values. For the eyebrows I created a new hair system but used the default material that comes with Maya Hair at almost a black value with slight transparency. Hair takes time to render correctly so don't get discouraged if it's not perfect right away.

18 Render Elements With everything ready to go, start rendering with V-Ray. I prefer to turn on Multiple Render Elements under Render Settings. Here you are able to choose what layers you prefer to render separately and therefore have the ability to adjust in composition later on. You can see the multiple layers I decided to render separately in the screenshot supplied with the issue.

19 Quick Photoshop comp All the hard work you've put in has finally paid off and now it's time to play around with some colours and values. At this stage I did some minor touch-ups and colour adjustments. One thing I found useful to do is to play with some overlays using your render elements. There is no right and wrong way of touching up your photos. Ideally you will have done most of your hard work before rendering, so you won't have to worry about adding too much at this stage. For this project, I darkened the lashes and played with the levels to find the exact look I was after.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

Synology®

EVERY HOME NEEDS A DISKSTATION

The entertainment hub that connects your life

BUILD YOUR OWN ENTERTAINMENT HUB WITH A DISKSTATION

Personal Cloud

Store and access all your videos, photos and music from anywhere, anytime.

Multimedia Streaming

You can stream movies, music and photos to mobile devices and TV using AirPlay and DLNA.

Power-Saving

The DS213j consumes less than 20w of power during full operation and is quieter than a library.

Can be purchased at:

amazon.co.uk dabs.com ebuyer.com YOYOTECH broadband buyer.co.uk

Synology apps available on:

iOS

CPC Gbit awards 2013 WINNER BEST NETWORKING MANUFACTURER

www.synology.com

Synology may make changes to specification and product descriptions at anytime without notice. Copyright © 2013 Synology Inc. All rights reserved. Synology is the registered trademark of Synology Inc. Other names of Synology products are proprietary marks or registered trademarks of Synology Inc. Other products and company names mentioned herein are trademarks of their respective holders.

Step by step
Easy-to-follow guides take you from concept to the final render

Artist info

Rainer Duda
3DArtistonline
Username: Rainerd
Personal portfolio site www.rainer-d.de
Country Germany
Software used 3ds Max, Photoshop, xNormal
Expertise Rainer specialises in creating assets for videogames, including building maps and texturing the final result

Build a vehicle game asset

Ready to roll out 2013

"Learn how to create and prepare a vehicle object for use in a videogame production"

Rainer Duda is a freelance 3D generalist focused on creating assets for high-quality videogames

In this tutorial we'll cover the creation of a static game asset, which can then be easily used in the Unreal Development Kit without the need to constantly jump back and forth between programs. As a base we'll be using a blueprint, which will be modified later on with some new components to create a more exciting asset.

It's important to establish a working low-poly mesh that includes a valid geometry representation but also at least two UV channels, a proper collision geometry and a LOD object. We will discuss each of these elements in turn throughout the tutorial.

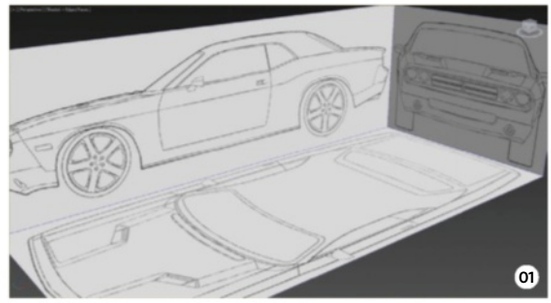
Following these steps we'll build a high-poly version of the asset from the existing low-poly geometry. We can then project these details onto the low-poly asset via a Normal map, as is the usual convention in contemporary videogame development. We'll use xNormal for generating the Normal map (**www.xnormal.net**), rather than just the 3ds Max tools. This is simply to illustrate that there are alternatives to the built-in toolsets.

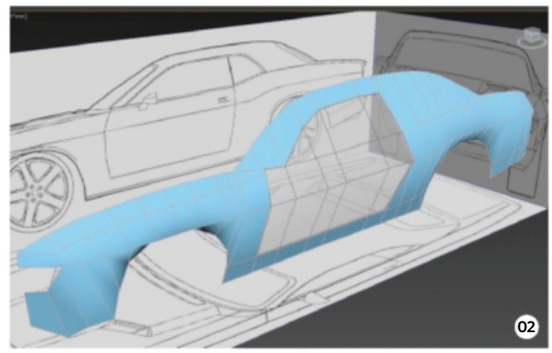
In addition to all the above, the low-poly asset will also be equipped with a Normal map and custom-painted textures to give it a final look.

Start the mesh

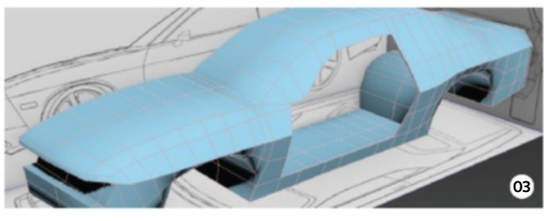
Use a grid and blueprint to begin

01 Prepare the scene Before the actual modelling process starts, prepare the scene with three grids, which will hold textures that cover the different views of the car from the blueprint (2001 Dodge Charger blueprint from **www.the-blueprints.com**). We'll need these guides to constrain all the proportions while constructing the vehicle chassis. This scene setup is actually quite simple. First we can just place a grid in the scene, scale it to a rectangle and unwrap it via a UVW Map modifier along with a planar projection. An Unwrap UVW modifier enables us to open the UV Editor and place the patches correctly. Duplicate this grid twice and match the UV sets to their corresponding places on the blueprint. For the front, scale the grid to a box and then place all of the sets next to one another in the correct order.





02 Get the grid working Now, with the template build container set, it's time to model the left side of the car. For this, use a grid with just a few subdivisions, convert it to an editable poly and place it parallel to the reference plane. Start moving the outer points along the silhouette and the middle points to fit the front and side shape. If the resolution of the grid is too low, then some more edges in between using the Connect Edges function in the Modifier panel will help. Take care that even in the silhouette you have a nice edge flow. For later use, it's best to place some cuts on the position where the door is situated. After selecting the edges from the cut, it's necessary to delete the polygons between the chamfer edges, as well as to extrude the open edges just a bit inside.



03 Add depth After the silhouette is looking good, it's time to start adding some depth. To do this, select the corner edges on the outside of the silhouette and extrude them towards the centre of the grid. As a result, a rough half body should now be visible. The new available points next to the centre of the grid need to be scaled up a little bit, as the car is bigger in the middle than on the outside. Now we can go one step further and add some more edge rows and chamfer to refine the depth of the car. This occurs by moving the points along the silhouette according to the top reference plane on the ground.

Learn how to

- ☑ Quickly build low- or high-poly meshes
- ☑ Unwrap static objects
- ☑ Render Normal and Occlusion maps
- ☑ Quickly build efficient collision geometry
- ☑ Export a flawless mesh

With the Disc

Tutorial files:

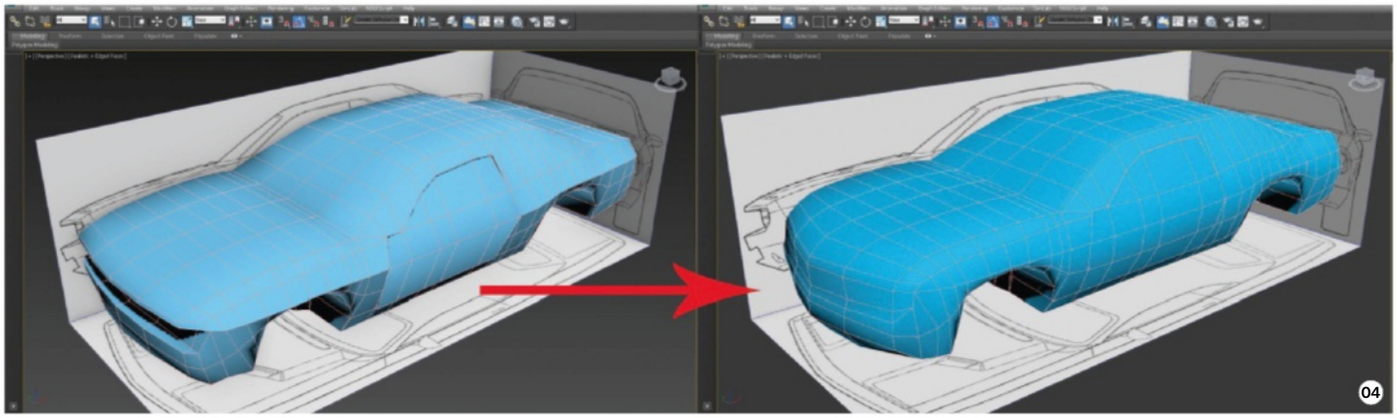
Rainer has supplied low- and high-poly solid and wireframe assets, as well as screenshots to help with the steps

Concept

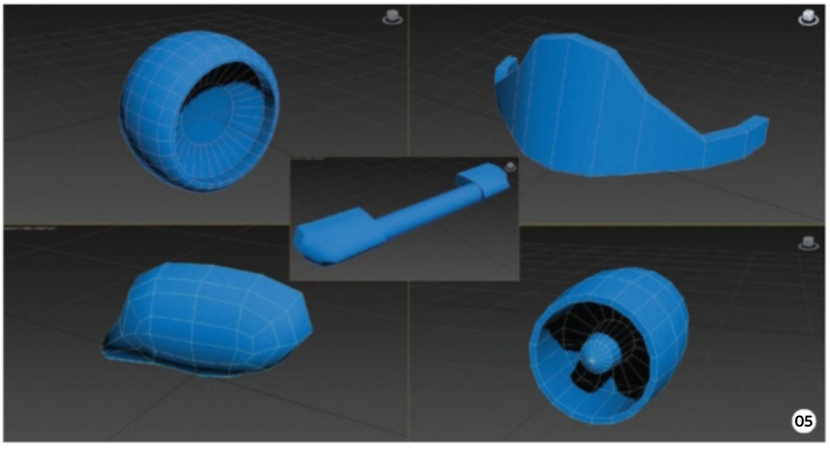
If you don't have any self-produced concept art or designs, blueprints are another great option. For a quick and easy start we will take a blueprint of a 2001 Dodge Charger from www.the-blueprints.com.

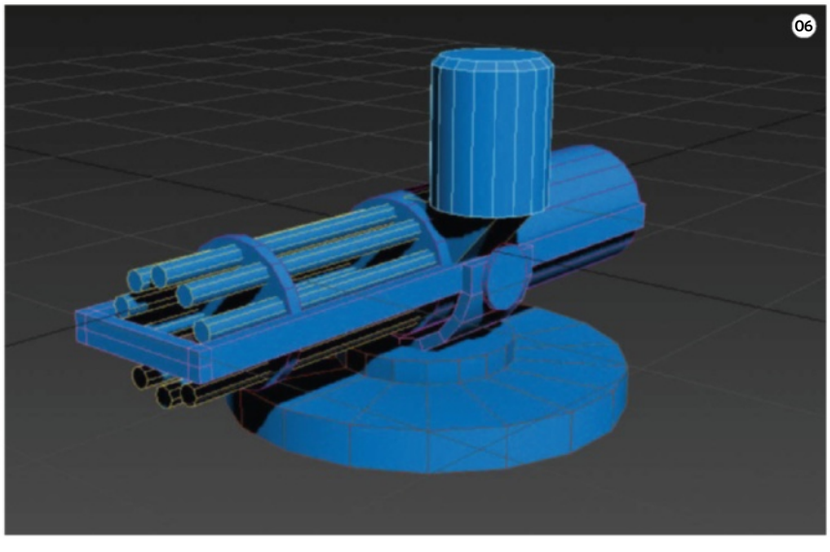
Bring in more features

Finish the initial mesh and start adding more elements



04 Complete the body To finish the body, return to the Mirror function in 3ds Max and use it to duplicate the first half of the mesh to the opposite side as a copy. Both of these pieces will need to be attached afterwards. Only the open edges at the middle of the car should be left after this. A quick and easy fix is to continuously select two vertices and weld them together. With this flow path, we can adjust some points after welding to fit the silhouette even better than before. It's important that we have a nice edge flow on the car, as this will help us later on at the high-poly-modelling stage.





05 Add more elements Some vital elements are still missing, such as the wheels, exhaust pipes and engine parts. We're also missing exciting additions, such as a ram and guns on top of the car. These missing bits are easy to model as we are still on the low-poly model. The details will come from the high-poly later on, so keep the geometries quite simple at this stage. Model just one wheel and one turbine out of a cylinder with a few insets and edge loops with different scaling. Note that all the props are being modelled in the centre of the 3D space, which makes things easier, especially when we switch to the high-poly stage. The ram is more or less just an extruded box, including a chamfer and a bit of vertex-scaling. The same procedure goes for the ends of the exhaust pipe, plus the mirrors, while the axle consists of a simple cylinder.

06 Time for the big guns The last sub-asset what we need is a medium-sized Gatling gun. We don't really need special reference for this piece, as we can imagine it however we like. The first thing to do is model a base structure out of a cylinder. After converting it to an editable poly, an inset and afterwards a poly-extrude will complete the base. The gun itself consists of one cylinder with a chamfer and ten simple cylinders arranged in a circle. Ammunition comes from a cylinder that stays vertical to the gun next to a funnel, which is quite simply a modified box. The holding structure is an extruded box braced by a half-cylinder that can be extruded along the normals. Again, note that we are using only simple geometries at this stage.

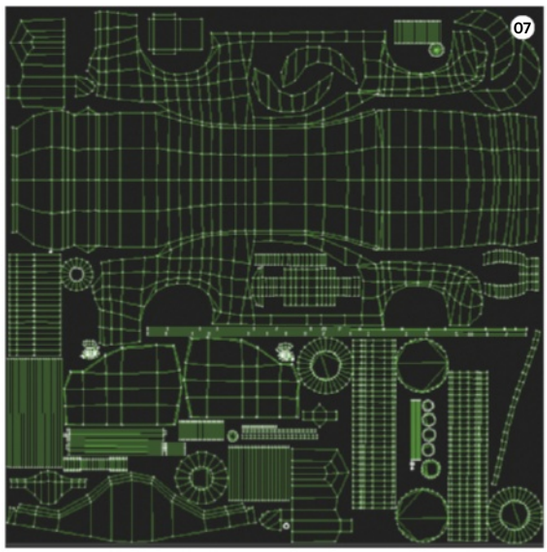
Creating your low-poly

There are several ways to build low-poly objects, but this tutorial uses only simple geometry to build the low-poly object, basically so that everything runs a lot smoother than otherwise. Some of the more-detailed pieces of the vehicle consist of a collection of small pieces that are stitched together. Of course, it's entirely possible to create a high-poly and then build the low-poly around it without any stitching of geometry at all. Imagine some of the Epic Games assets from titles such as *Gears of War* and *Unreal Tournament*, which were built out of a single mesh and still maintained quite a lot detail. Aside from this, stitched objects involve even more attention during the Normal map generation process.

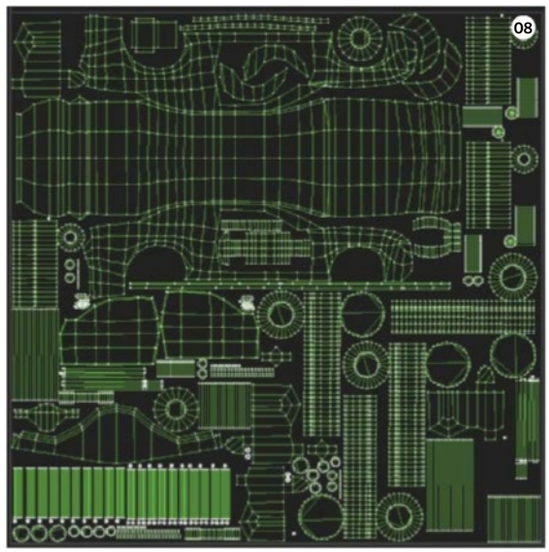
Finalise the sculpt

Begin unwrapping to project details and paint the object

07 Build space to paint Before we start painting or even exporting elements of the car, we need to unwrap the low-poly with a UVW Map modifier. Be careful and overlap as many parts as you can, as it makes sense to save space and scale them up later. Both the front and back wheels can be overlapped and of course all the gun barrels, plus the remaining parts that are symmetrical to one another. Don't try to flip UV sets, because this can produce Normal map errors that we'll have to fix later in Photoshop by inverting the Green channels.



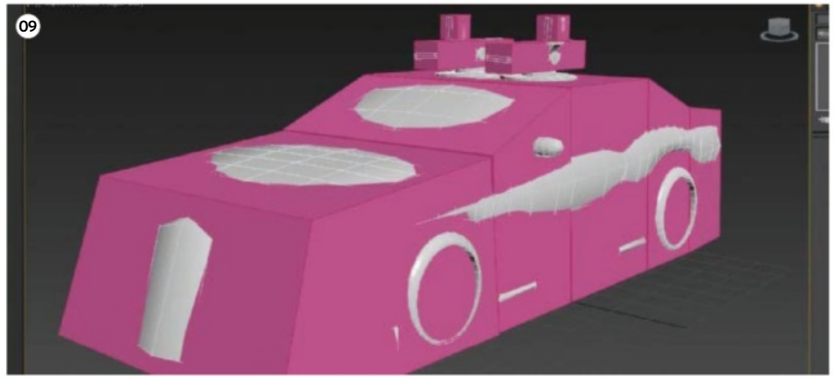
08 Let there be light The UDK gives users the possibility to use their own UV channels for the Light map, which is useful as we can decide for ourselves what kind of polygons get more light information than the others. The only difference in comparison to the first UV channel is that there can't be any overlap on the Light map. By increasing the map's channel to 2 and clicking on Abandon, a new UV channel will be created. It's necessary to reorganise all meaningful polygon units so that there is no overlap at all.



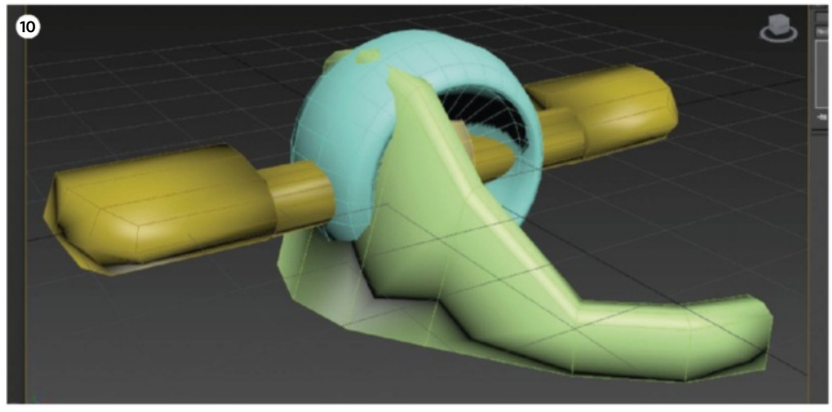
Choice of coverage

The newest version of Epic Games' UDK supports collision geometries that are stitched together as well a prefix like UCX instead of MCDCX. The latter was used when Unreal Engine 3 was released, but it still works fine. If there is no time to spend building a collision geometry, or it's simply not that important, there is another solution you can opt for. UDK offers built-in tools to create collisions inside the static mesh viewer. Users can choose between simple collisions up to convex shapes. The same built-in feature actually exists for the creation of a UV channel for a Light map. This shows how there's no need to struggle with 3ds Max if you're unfamiliar with it.

09 Set up a collision model At this point the low-poly isn't ready for the game world, as it needs information relating to where the player is unable to move through or over. To provide this information, build nine simple boxes that cover almost the whole car, including the guns. It's important that the boxes aren't touching or intersecting with one another. After all the boxes are in place, it's time to attach them and give the new piece a name with the prefix 'MCDCX' followed by the name of your low-poly. After exporting the low-poly, complete with the collision geometry, the UDK will interpret the second geometry during the import as collision data.



10 Export and map-generation xNormal takes low- and high-poly meshes as separate inputs, which is good for us because at the moment we only have the low-poly version. What's important at this stage is that we don't export the whole vehicle at once, but rather its various units. To do this, split the complete vehicle into parts to be on the safe side and to obtain proper maps. At the end you'll have the body, one wheel from the front, one from the rear, both mirrors, the bumper, one turbine and an exhaust pipe. All of these parts need to be centred in the 3D world. In addition we'll keep another version of the complete low-poly vehicle as well. Unfortunately we have to explode the turret to make it work properly. This means all the parts that aren't overlapping need to be detachable and separated from the main mesh and as such can be exported separately. Furthermore, low-poly parts for the map-generation need to have just one smoothing group.

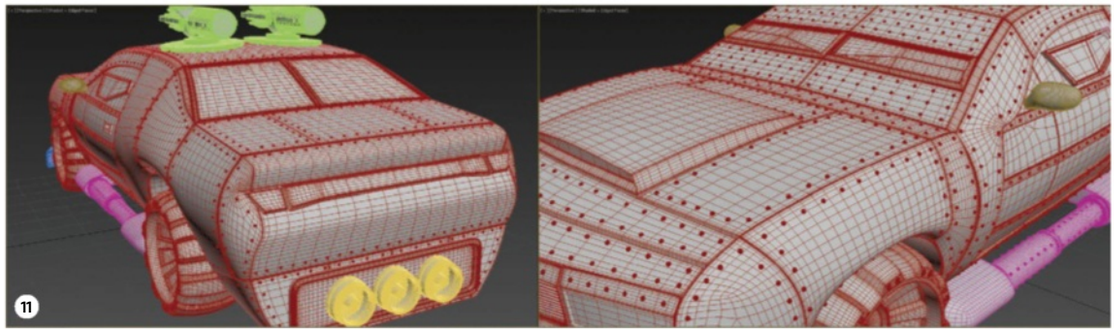


Make the high-poly mesh

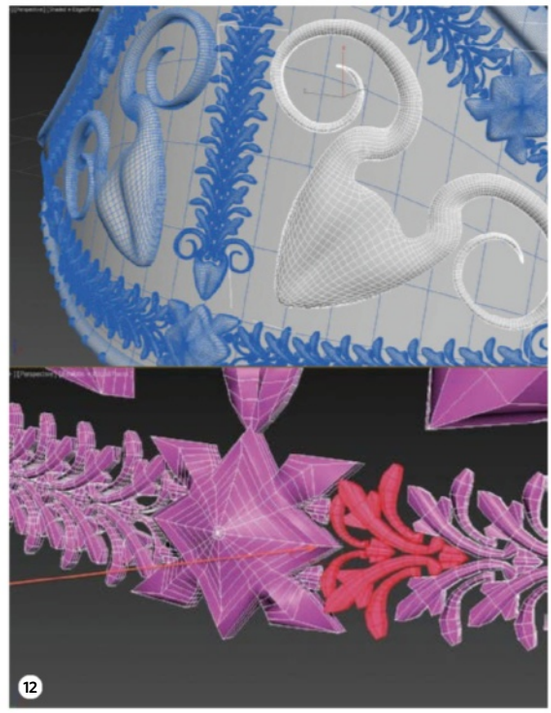
It's time to slice the low-poly and build high-poly parts

Maximise on polygons

For this vehicle we built a high-poly directly in 3ds Max. However, you'll find there are certain limitations when working with a large number of polygons, as if the number is too high or your machine too slow, it simply won't be possible to work in a simple manner without any crashes and distractions. As a consequence, users can switch the whole high- and low-poly-building process to ZBrush. Pixologic has implemented a highly useful function to render decent Normal maps, but alternatively it's also possible just to create a high-poly mesh and use it in combination with xNormal and a low-poly object from 3ds Max to achieve the same result.



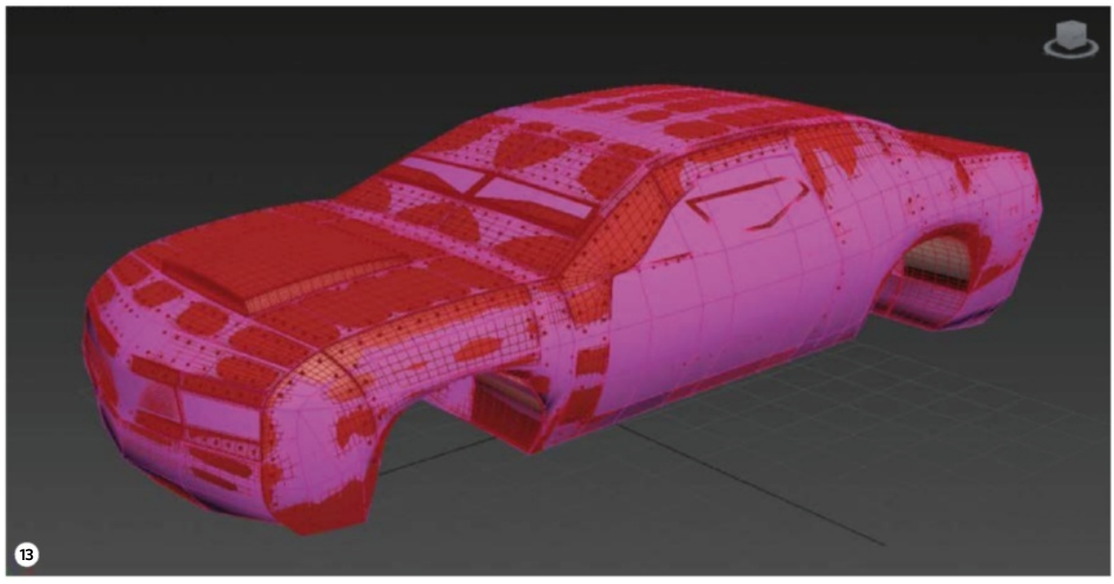
11 Time for metal Our low-poly has a straightforward edge flow and that's key to building high-poly metal plates. Now it's time to slice the low-poly mesh vertically and horizontally. The outcome must be single-sided plates and stripes that need to be extruded and closed. A chamfer on the outer edges will produce some nice gaps. Next to this some more details should be added such as a back light, openings at the back, grilled windows, rivets, door handles, a front grill and so on. To save time, it's possible to skip the modelling of the window grills, because this detail can be added on the Normal map through a texture transformation. There are many programs that convert pictures to a Normal map, such as CrazyBump or the NVIDIA Normal map tools for Photoshop. However, you need to be aware that an unwrap is never 100 per cent stretch-free and the spot to replace texture pieces must be very carefully selected.



12 Include ornaments for the final touch Add some details around the car to make it feel a little more unique. To build these ornaments, add a few boxes in a row and subdivide them to build very rough formations such as leaves and square-shaped flowers. Adaptations can be made by moving vertices and splitting edges, plus extruding along paths. After that it's easy to duplicate them in one direction as much as is needed to build longer chains. When the various ornament chains are complete, a Path Deform modifier combined with a path can be used to adjust the positions of each chain. The overall resolution must be increased by using a Turbo Smooth modifier.

13 Prepare to export the vehicle mesh

Next merge the high-poly objects, such as the rivets, together with the objects underneath, and the ornaments with their base meshes. Basically we need to attach all the high-poly pieces together that belong to their corresponding low-poly meshes. Before you start the actual exporting, you must take care that the meaningful units of the high-poly meshes match their positions with the corresponding low-poly objects. Just try to avoid offsets and you'll be ready to export all of them.



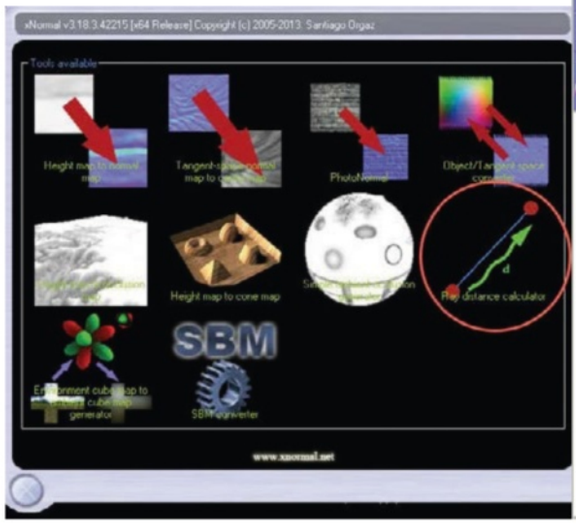
Create the maps

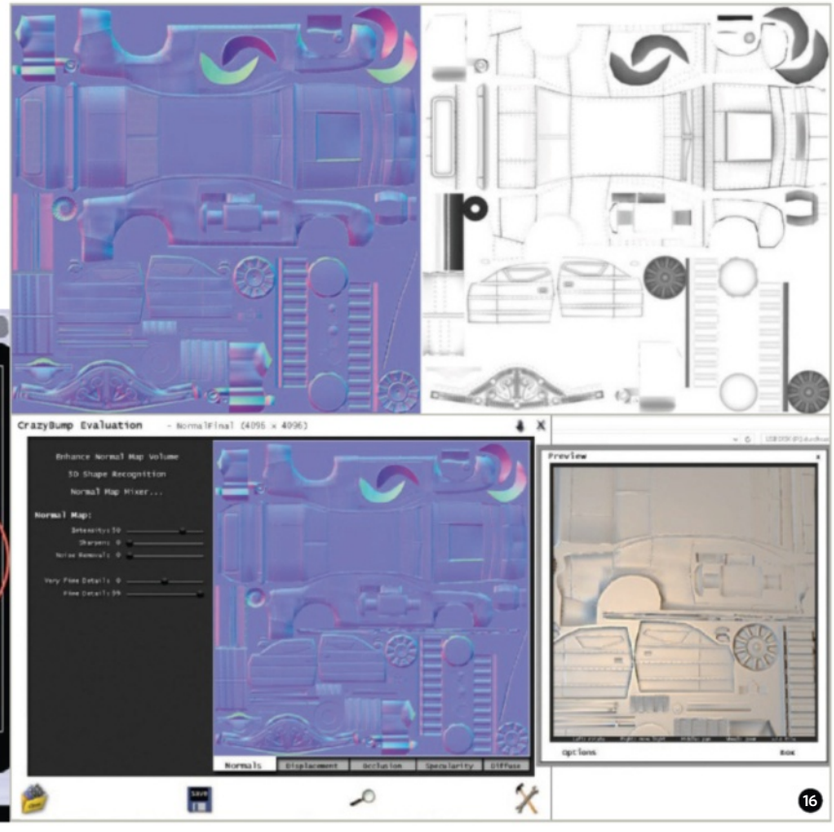
Take your meshes into xNormal

14 Import all the meshes Open xNormal and import all the high- and low-poly meshes into their respective slots by clicking the Import button. A proper naming convention pays off at this stage. Each object set – matching low- and high-poly – must be activated separately for rendering the maps. This can be done quite simply by activating and/or deactivating their checkboxes.

15 Name of the game We can now begin setting up xNormal. Move to the Baking options to create Normal and Occlusion maps by activating the relevant flags. To increase the quality of the projected details, it's recommended to set the Antialiasing to 4x. If polygons within the UV channels are too close, a higher Edge Padding number will cause overlaps. A value of 3 pixels or even less is reasonable, but here we've opted for 4. Last, the Output Resolution needs to be set, as well as the format, which we can set to TGA. If the vehicle is for an in-game cinematic, we can use a larger resolution such as 2,048 or more.

16 Use an optimal projection cage xNormal gives users the ability to take advantage of an implemented ray distance calculator that puts a projection cage around the high-poly to measure the ray distance between the high- and low-poly meshes. How accurate the calculation is depends entirely on the time that the calculator is originally given, but so long as the calculator measures as more detailed, the maps will look better. Any calculation that lasts longer than one minute is fine in principle, because the cage has had enough time for the calculations to expand correctly. After this stage all that's left is to copy the results and generate the texture maps. The final steps in this process involve combining of all the parts to complete both maps in Photoshop. If the Normal map detail isn't quite strong enough, you can try moving to CrazyBump, which is perfectly capable of increasing the intensity needed for the final result.





Move to post-production

Build texture maps in Photoshop and finalise your asset

17 Build two maps Now Photoshop can be used to paint two new maps; one to keep the diffuse and the other for specular information. For this vehicle, the diffuse will contain just a few variations and mostly dark colours with only a few details. For both maps we can use some rusty, dirty and bare-metal textures from portals like **www.cgtextures.com** and overlay them where it makes sense. Reduce the visibility of the respective layers and make intensive use of the Eraser Tool to add some variation to the specularity. With a combination of brushes and tones try to add a *Mad Max*-like look to the vehicle.

18 Ready to roll out The complete low-poly object can be exported out of 3ds Max, including the collision geometry, as an FBX file. The asset and textures are now ready for import into the UDK game engine. If you want to achieve more details on your mesh, just use detailed Normal maps like developer Epic did on their assets. The principle behind this idea is having a tileable Normal map added to the base Normal map of the vehicle in the Material Editor. For rendering inside 3ds Max, we need a material that contains a Normal/Bump as the Displacement map source.

Mapping alternatives

If you'd rather not use xNormal for this process, then no worries. You can easily use the 3ds Max built-in map generation tool named Render to Texture. This needs a low- and high-poly too, but there are several options that need to be set, such as using the existing UV channel instead of an automatic unwrap once selecting a low-poly. When a high-poly is selected, the low-poly will be equipped with a projection cage. That cage needs to be reset to work properly and must be close to the high-poly.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

QUALITY. INNOVATION. RESPECT

www.gamestm.co.uk

games™

Available from all good newsagents and supermarkets

ON SALE NOW

■ Inside Watch Dogs ■ History of Rare ■ PS4 & Xbox One Previews

BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print Tablet Phone Desktop

facebook.com/gamesTM twitter.com/gamesTMmag

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

Peter Blight

Personal portfolio site www.peterblightconceptdesign.com
Country Australia
Software used Bunkspeed Pro 2014
Expertise Peter Blight is a freelance Vehicle Concept Designer specialising in sci-fi

Create Bunkspeed renders

Adaptive Field Tank 2013

Bunkspeed Pro 2014 60-day trial with the disk

> Here we'll look at how Bunkspeed can be used to showcase a sci-fi vehicle concept in the shortest possible timeframe

Peter Blight Sci-fi and fantasy concept designer

Bunkspeed's suite of products is famous for achieving beautifully rendered images at breakneck speed. Here I have re-imagined an original concept I created several years ago, the Adaptive Field Tank.

The AFT is half jet, half tank, built to take advantage of the unusual physics of cyberspace. In reality, you can't just stick a jet engine on a tank without causing problems – treads don't move that fast and the aerodynamic drag would prevent it from reaching a decent speed. In cyberspace, the treads only materialise where they contact the ground and are attached by code alone. This keeps the ship in ground effect for pursuing hyper-fast wheeled vehicles in areas inaccessible to air attacks, with the additional advantage of being tethered to very grippy tread segments to absorb the recoil of its powerful turret and weapon pods. Make no mistake, you don't want this beast on your tail.

Putting myself inside the mind of an evil computer-world overlord perfecting his secret weapon, my process is to achieve a final render as fast as I can while still making it interesting. You can see examples on this vehicle of some very quick and dirty modelling. For model completionists, there is a link on my site to the full-scene digital model kit with the original Prototype-A Adaptive Field Tanks (available for a modest donation to my digi-supplies fund). For this tutorial, I present the AFT Prototype-B.

I'll take you through the process of importing the model, using pre-made and generated custom materials, decal application, environment setup and rendering. The tutorial version of the tank has treads which materialise as a solid. To mimic the main illustration with pure energy elements, experiment with the emissive material settings and apply to wherever you feel the tank needs some glow action.

With the Disc

Tutorial files:

- Full scene file for the tutorial, full .obj model for importing, and associated materials, HDRI and decal.

Concept

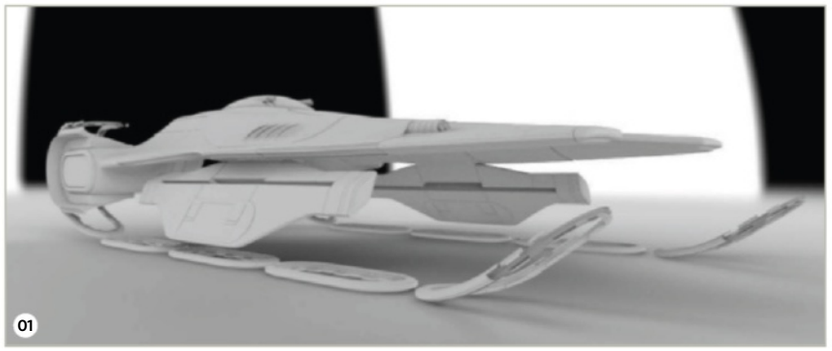
I conceived the Adaptive Field Tank as a vehicle that bends the rules of physics in cyberspace to generate field-linked treads only where it contacts the ground. This frees up the body to be as aerodynamic as possible – for something covered in weapons, at least! It's a jet/tank hybrid, with a dash of Japanese magnetic levitation thrown in for good measure.

Learn how to

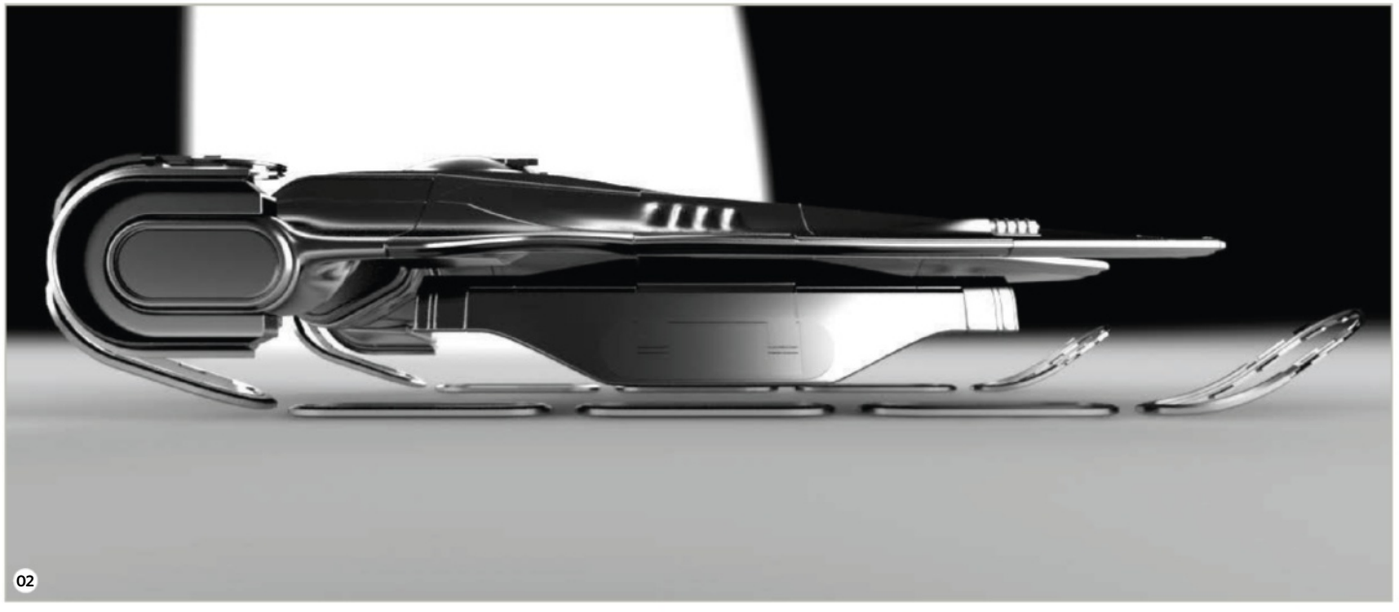
- ☑ Import and navigate the Bunkspeed interface
- ☑ Quickly create custom materials
- ☑ Browse pre-made materials online within the software
- ☑ Assign a decal with no need for UVs
- ☑ Add an environment HDRI and create a final render

Prepare and render your model

Quickly set up and complete a Fast mode render of your work

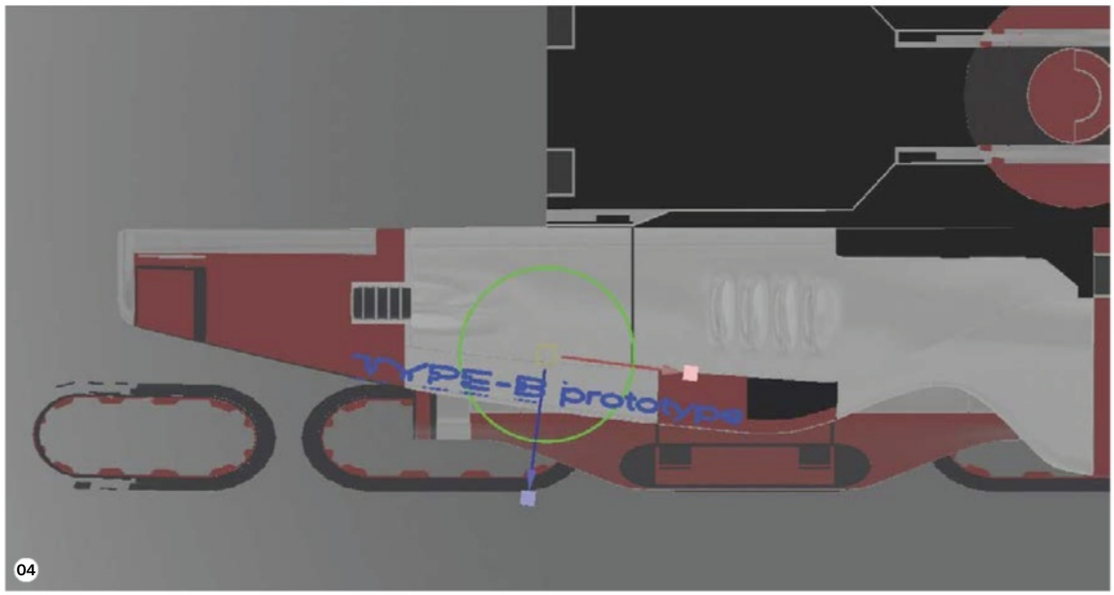


01 Getting started Open up Bunkspeed and select the Hybrid renderer (if this is not already selected) then hit New Project. Under the Project Menu, select Import Model. Select the file AdaptiveFieldTankTutorial.obj from the cover CD provided with the magazine. In the Import Settings menu, select Materials tab, check Ignore Texture References and then press OK. Ensure that you have the Fast button pressed in order to take advantage of the realtime preview. Some quick navigation tips include Alt+ hold left mouse button to rotate, Alt+ hold right mouse button to zoom and Alt + spin your mouse wheel away from you to exaggerate the perspective for a more dynamic pose.



02 Create custom materials In the right tool panel, select the Material tab. Here we can make the whole thing prettier with just a couple of tweaks. Select the default material's Material Type drop-down box and change it to Metal with roughness set to 9.82. For the headlight/eye sensors, right click in the black space next to the default material and select New Material. From the Material Type drop-down box, select Emissive. Set the intensity to ten and the colour to pure red. Click on the material and drag it over the headlights and eye sensors of the tank to assign.

03 Browse pre-made materials In order to give you more choice of materials you can join the Bunkspeed site and then use that login to access their asset/material library directly from within the software. Click the top-right hyperlink within the application Login to Bunkspeed and the File Library tab, and you'll see two icons appear beneath the tab to toggle between the local and web library. Go into the Metallic Paint sub-folder and grab Plasma Red and Metallic Night. Using the screenshots in this tutorial as a guide, apply each material to the various body parts to achieve a nicely balanced paint job. Alternatively, I've provided these specific materials with the cover disc tutorial files.

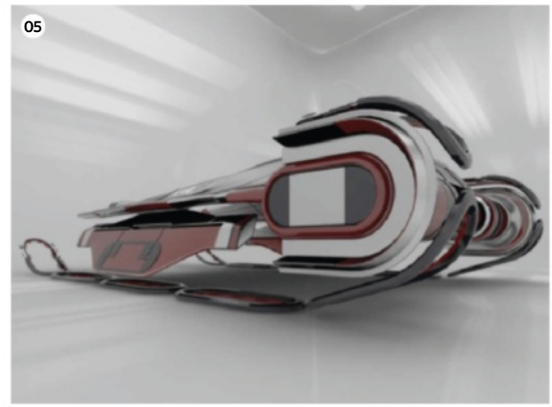


04

Decal use

Sometimes decals will appear to be floating over the surface of an object rather than stuck to it. This is caused by the scale of the objects in the scene being too small, and is easily rectified. In the quick menu panel in the top of the screen, ensure the Selection Tool is set to Model and that the sub-selection is also Model. Select the Object Manipulation Tool and click the Scale icon. Hit Ctrl+A in order to select all, and then scale the scene up several times using the manipulator inside the viewport before re-applying the decal.

04 Assign a decal In order to efficiently assign a decal it's helpful to do so in an orthographic view and set render mode to Preview while positioning the image. You can either rotate the existing camera to look directly down at the tank and check the Orthographic checkbox in the Camera Properties tab or use the top view from the multi-viewports option in the View menu. Right click in the black space next to your materials and select New Decal. Select DecalByJamienListon and drag it onto the model as shown. Click Project from Current Ortho Camera button with the decal selected then scale/move to fit. Uncheck Detatched and ensure Multiple Part Decal is checked.


05

05 Environment setup In the File Library tab, go into the Environment sub-folder and grab the Studio 008 HDRI. Drag it into the viewport to assign it to the scene. Click on the little wireframe planet icon for the Environment settings and set Gamma to 4 and brightness to 0.77. The Bunkspeed site has a huge number of HDRIs to choose from, though I found this one to be the most appropriate for a cyber tank. If an HDRI has a weird ground but a decent sky, you can create simple geo in Bunkspeed to block it out and assign a ground texture.

06 Rendering The most satisfying part is render time, especially when using Bunkspeed PRO 2014's new Fast mode. Accurate is almost as quick, depending on whether you want to see more accurate glows/reflections etc. I recommend using Fast regardless just to bang out a bunch of stills to decide on an angle before setting up an Accurate render at full resolution. After you've picked the optimal angle, hover the mouse over the floating menu towards the top of the screen and click the camera-shutter icon Render. Set it to render to 3,000 pixels wide, the Render Mode to Quality, and the Number of passes to 1,500. Output as a .PNG in order to avoid compression artefacts, and you're good to go!

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

Soft-body sculpting in Blender

Pteranodon of the Cretaceous Period 2013

> The goal of this render is to portray the beauty, majesty and terror these creatures likely would have inspired if they were alive today

Jonathan Williamson runs www.blendercookie.com, where he teaches Blender through tutorials and courses alongside his fellow instructors

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

Jonathan Williamson

3DArtist online

Username: carter2422

Personal portfolio site http://cgcookie.com/blog/author/jonathanwilliamson

Location USA

Software used Blender

Expertise Jonathan specialises in both organic and hard-surface modelling in Blender

With the Disc

Tutorial files:
Final model for part 01: /part01/models/pteranodon.blend

During this tutorial we're going to work through the process of modelling a complete Pteranodon from the late Cretaceous period. We'll be using Blender for the full creation process, including sculpting, retopology and UV-unwrapping. In the following parts of this tutorial, in issue's 61 and 62, we'll complete the rigging, texturing, lighting, rendering and compositing – all in Blender.

For this project, we'll be starting with Blender's Dynamic Topology sculpting system to create good forms and volumes in an artist-friendly manner. Then we'll retopologise the sculpt using edge-by-edge extrusion methods with surface snapping to carefully map out a clean topological form. Once the retopology is done, we'll move on to quickly unwrap the mesh UVs to prepare for texturing. Last, we'll finish up with detailed sculpting, using a Multiresolution modifier, so that we can put in all of the beautiful muscle detail this creature likely had.

Due to the expansive nature of the subject matter, here you'll find more of a broad-stroke overview of the process to give you key insights into this sculpting workflow.

Learn how to

- Use Blender's Skin modifier
- Sculpt with Dynamic Topology mode and the Multiresolution modifier
- Retopologise sculpted forms with surface snapping
- Unwrap UVs cleanly

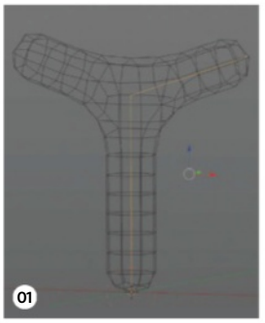
Head to **www.blendercookie.com** for more in-depth tutorials, features and interviews

Concept

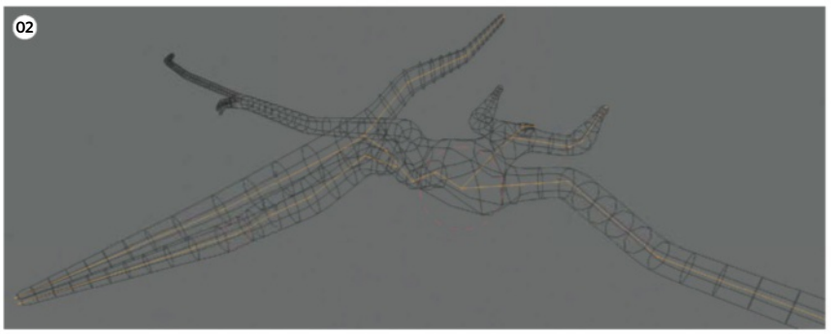
The design for the Pteranodon we'll be creating comes mostly from the fossil records we have. I've based the sculpt on the skeletal forms and other artist renderings I could find to try to create a relatively accurate model.

Start basic

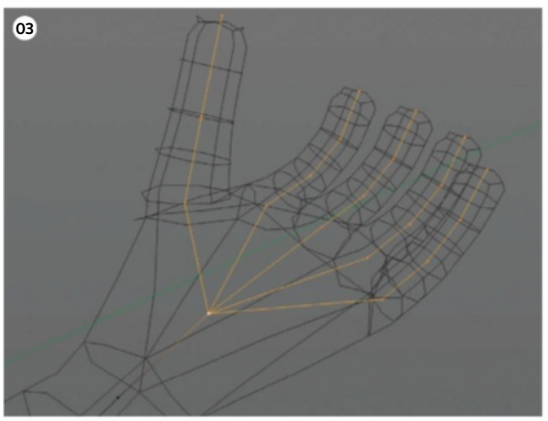
Create a foundation to work from



01 Begin with a Skin modifier base mesh To create our base mesh, we're going to use the Skin modifier, which takes edges as an input and creates an extruded volume from those edges. Results from the Skin modifier are always quad-only polygons, making it very easy to create a fast starting point for sculpting. To add the Skin modifier, first add a Plane object and then reduce it down to a single edge in Edit mode. Next you can add a Mirror, Skin and Subdivision Surface modifier, which will give you a rounded, cylindrical mesh that's mirrored across the X axis. This is perfect for our base mesh.



02 Build out from the base Once the modifiers are added and you have an edge to start with, creating the body is simply a matter of extruding vertices one by one. As you extrude vertices, the radius of the generated mesh can be adjusted via Cmd/Ctrl+A, after which the scale can be constrained to the local X or Y axis by hitting X or Y. This enables you to better define the final form. In my base mesh, you'll notice the lower jaw has been added as a separate, disconnected piece. This gives greater control over the shape of the area, due to the close proximity. After I'm finished with the Skin modifier, I'll separate the jaw to a new object and use a Boolean Union to join the meshes.

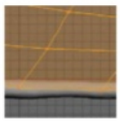


03 Create the hands and feet With the body base mesh created, it's time for the tricky part – making the hands and feet. The hands lie along the second wing joint. The wing extends from an enlarged little finger, but for now we'll focus on the feet. The same process is used for both. The trick is to extrude an edge to the base of each toe, then extrude a vertex for each joint and tips of the toes. Last, select the centre vertex of the foot and select Mark Loose in the Skin modifier. It may be necessary to tweak each toe to get the mesh to behave, as these areas can be a bit tricky.

Don't get wrapped up in the skin

The Skin modifier works great for creating quick base meshes. However, it's not meant for creating detailed meshes. The goal is to make a simple mesh that provides the rough shape and proportion of what we're going to be creating. The sculpting tools are better suited for refining shapes and adding detail to an already existing form.

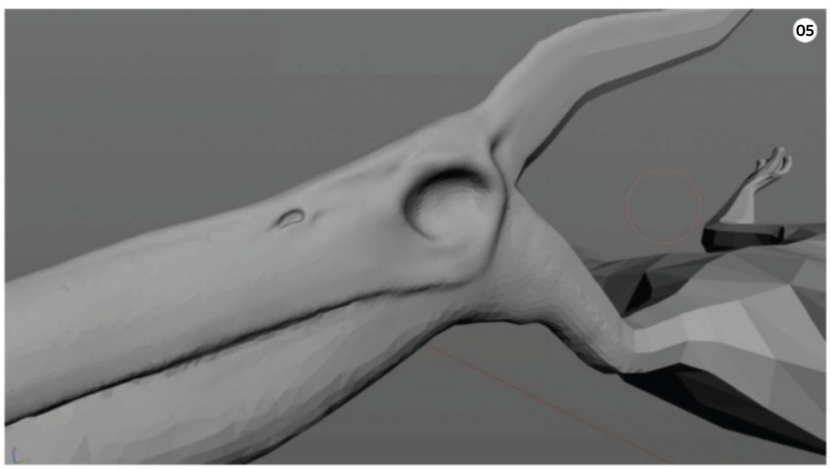
There's no need to worry about details at this stage, just quickly create the basic structures needed to represent your subject matter. If the Skin modifier doesn't generate a clean mesh, Dynamic Topology will tessellate it.

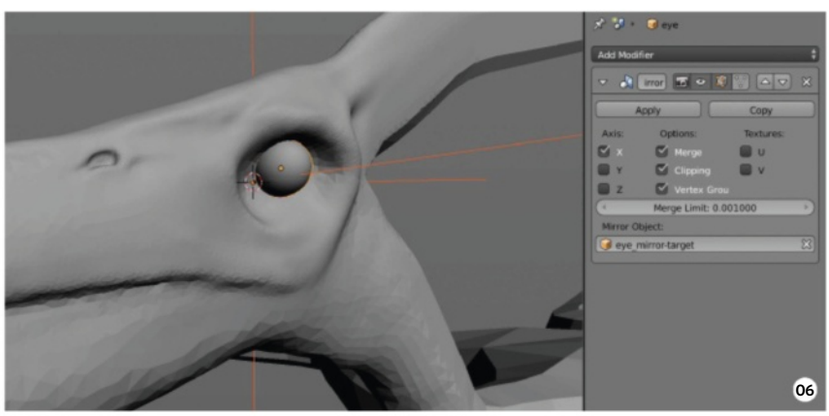


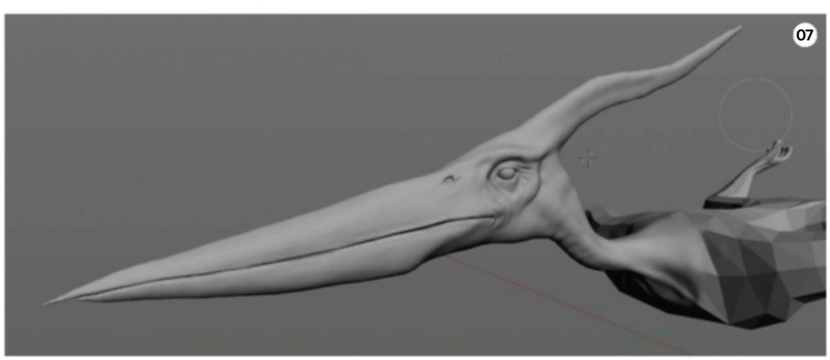
Build up the forms

With the base mesh created, it's time to start sculpting

04 Enable Dynamic Topology Before we begin sculpting, we need to boolean the jaw, apply all the modifiers and enable Dynamic Topology. To boolean the jaw, it must first be separated in Edit mode by selecting it and hitting P. Next add a Boolean modifier in Object mode, set it to Union and assign the jaw as the target object. Now apply all the modifiers by pressing Apply on each modifier, starting from the top down. It's important to go top-to-bottom, as the modifiers work in a stack, with each one using the result of the modifier above it as the input. You must be in Object mode to apply the modifiers. Applying them will create a mesh that can be further modified. Now switch into Sculpt mode and enable Dynamic Topology from the Topology toolbar panel.







05 Sculpt the basic forms With Dynamic Topology enabled, we can now begin sculpting the basic forms that make up the Pteranodon. As we sculpt, Blender will automatically tessellate the mesh under the brush to add the necessary detail. The amount of tessellation is based on the Detail Size setting in Screen Pixels. Start with the eyes and work out from there, all the while examining skeletal references from fossil remains to determine the bone structure. You can find many skeletal references online. First we'll create the orbital socket and begin adding the nostril and jaw junction.

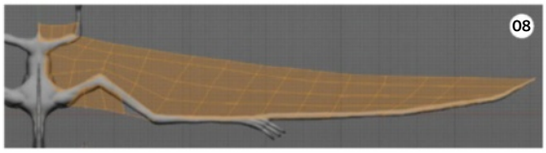
06 Add the eyes As we're sculpting it's a good idea to include a separate object for the eyeball. This makes it easier to sculpt around and tends to give a nicer result than shaping the eyeball and head as a single piece. To do this, add a UV Sphere with a Mirror modifier. Next add an Empty object, positioned at the centre of the head, and assign it to the Mirror Object field of the eyeball's Mirror modifier. This makes the Empty act as the mirror centre line.

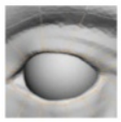
07 Establish the key shapes With the eyeball added, we can now sculpt the eyelids around the sphere. While doing this, we can also begin sculpting the key details that make up the head, including major skin folds, the jawline and so on. As far as brushes go, the Clay Strips, Crease and Inflate are most useful for this task. At this stage, it's important not to get too caught up with the details. Instead, focus on the overall forms and the defining shapes. The main details will be added later once the model is retopologised, so continue this sculpting process to rough out the entire model.

Dynamic Topology mode

When sculpting with Dynamic Topology it's very easy to go overboard and create an overly dense mesh that's difficult to control. If this happens, use the Simplify brush to selectively reduce the geometry in the necessary areas, or enable Collapse Short Edges to remove any edges shorter than the detail size with your active brush. Another performance tip is to disable Double Sided in the Object Data properties of your object. This will greatly improve the sculpting performance on most machines.

08 Model the wing membrane Now that the rough sculpt is mostly done, we need to create the wing membranes. This is most easily done with regular poly-modelling, rather than sculpting. The membranes should be added as a separate object, with no real connection to the sculpt. Once we retopologise the sculpt, the membranes and body will become one mesh. Create the membranes by adding and extruding a plane in the shape of each membrane. After the mesh is created, add a Mirror and Solidify modifier for symmetry and thickness.



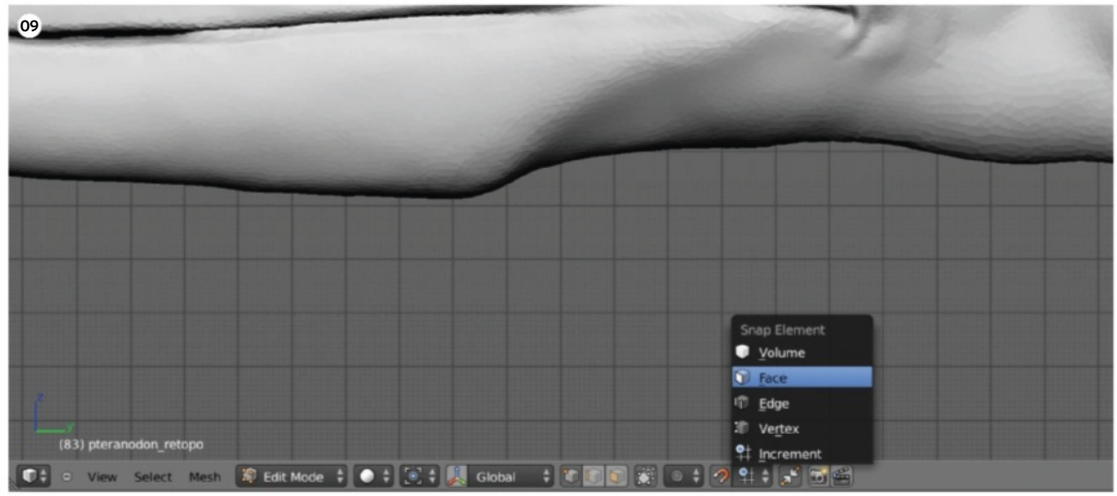


Begin retopologising

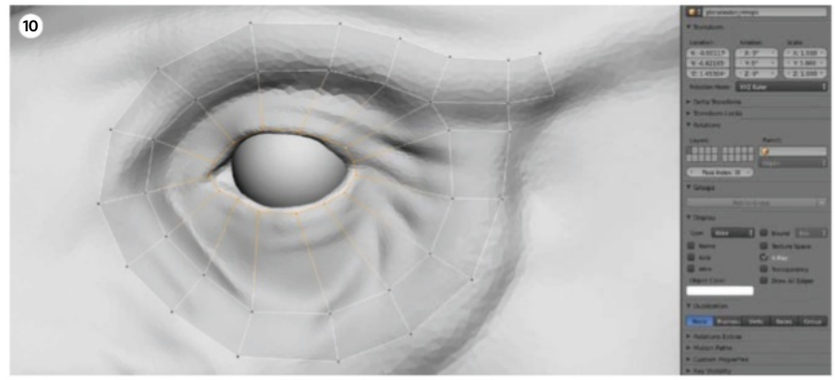
After establishing broad forms it's time to retopologise the sculpt

09 Retopology with face snapping

There are several ways to retopologise objects in Blender, but the simplest is to use face snapping. To do this, turn Snapping on by default, using the horseshoe magnet icon. Next, switch the Snap element to Face and enable Project Individual Elements on the Surface of Other Objects. Now create a new object, anything will do, and delete all the vertices in Edit mode. We're now ready to start creating the retopology mesh.

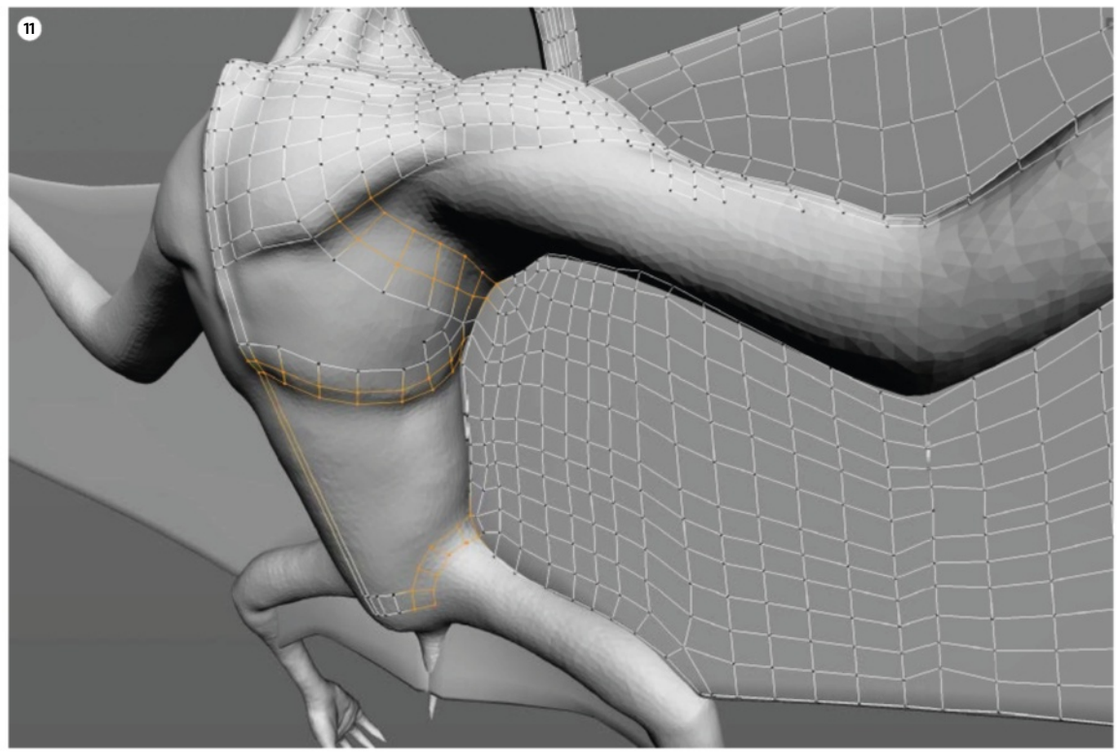


10 Attach some primary loops Once you're back in Edit mode, you can start creating the key face loops that make up the Pteranodon form. As with the sculpting phase, I like to start with the eye. To start the loops, add a circle with Shift+A and select Circle. Next, adjust the Vertex Count input and align it to the view via the Operator panel, located at the bottom of the toolbar. Now snap the circle to the surface by activating any Transform operation (Translate, Rotate or Scale). From this point on it's a matter of extruding edges to create the necessary mesh. As you extrude the retopology mesh, keep in mind that we'll be using this for an additional layer of sculpting soon, so try to keep it clean and evenly distributed, preferably by making it quad-only.



11 Retopologise the whole form

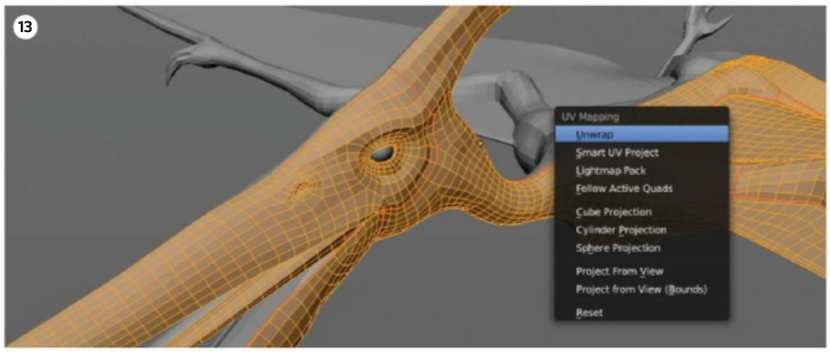
Now you can continue laying down loops and filling in patches of the mesh, all the while being sure to snap the vertices to the underlying surface. Remember, snapping is activated any time a Transform operation is used. Also be aware that snapping works by projecting the selection onto the underlying mesh from the current view. Creating a clean retopology mesh mostly comes with practise. One of key things to keep in mind is that the mesh flow should follow the muscle and bone structure, and the mesh density should be enough to provide clean deformations during posing or animating. This is a slow and often tedious process, but stick with it.

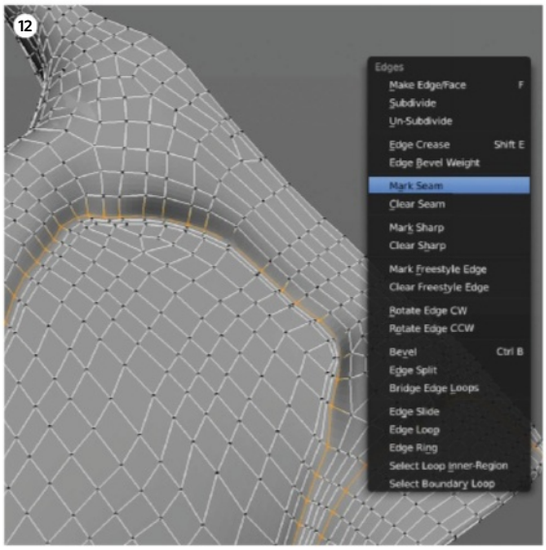


Unwrap the UVs

After retopology is complete, organise and unwrap your UVs

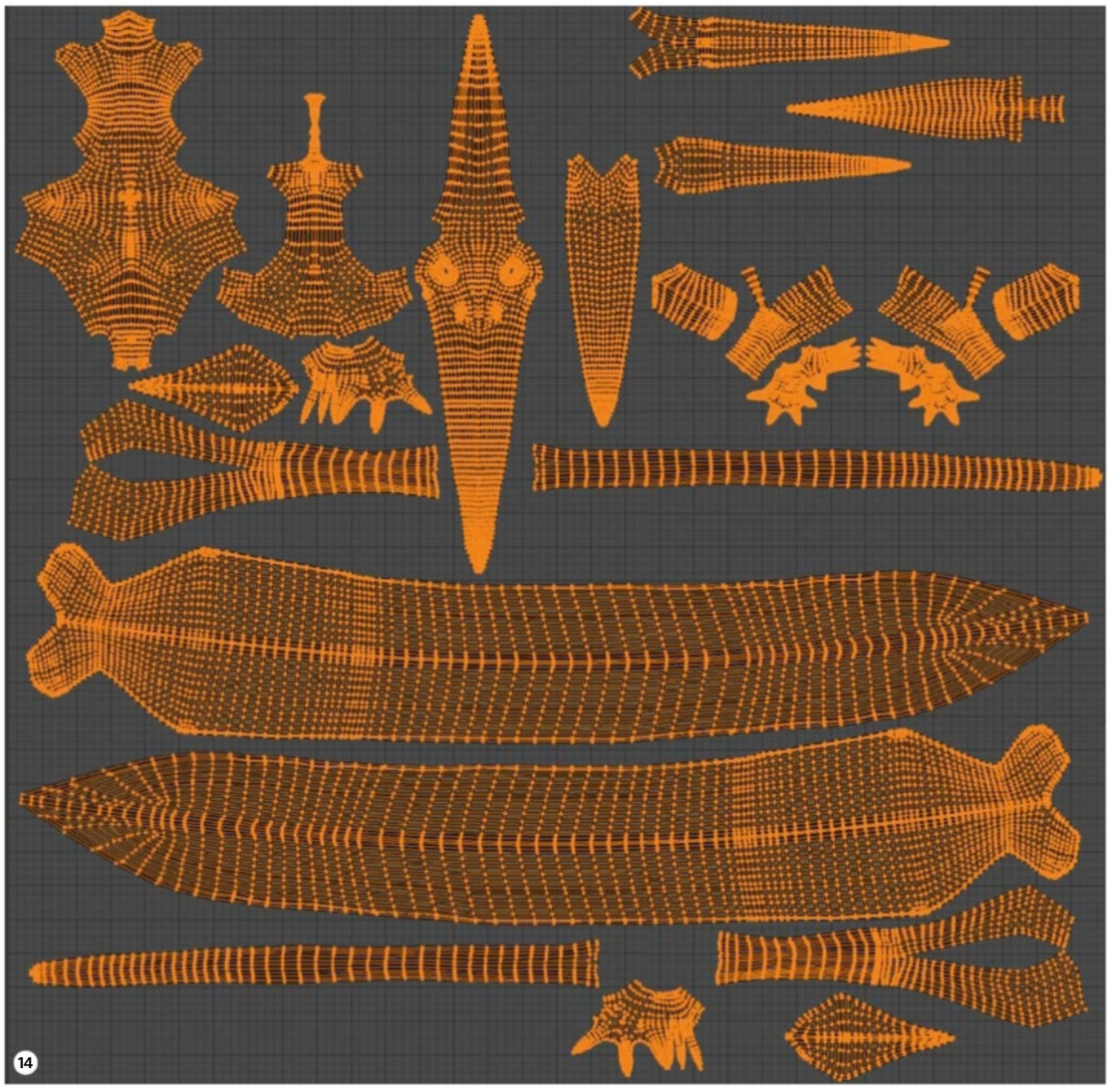
12 Set up the seams Unwrapping the UVs for the mesh isn't strictly necessary at this point, but it has to be done before texturing can begin. This process also helps to test our mesh, ensuring no changes are necessary while it's still fresh in our minds. To begin the unwrapping, we first tag edge seams in the model. These seams will designate island borders of the UVs, enabling us to separate the parts in a sensible manner. To tag edge seams, simply select the edges to be tagged, hit Cmd/Ctrl+E and select Mark Seams.





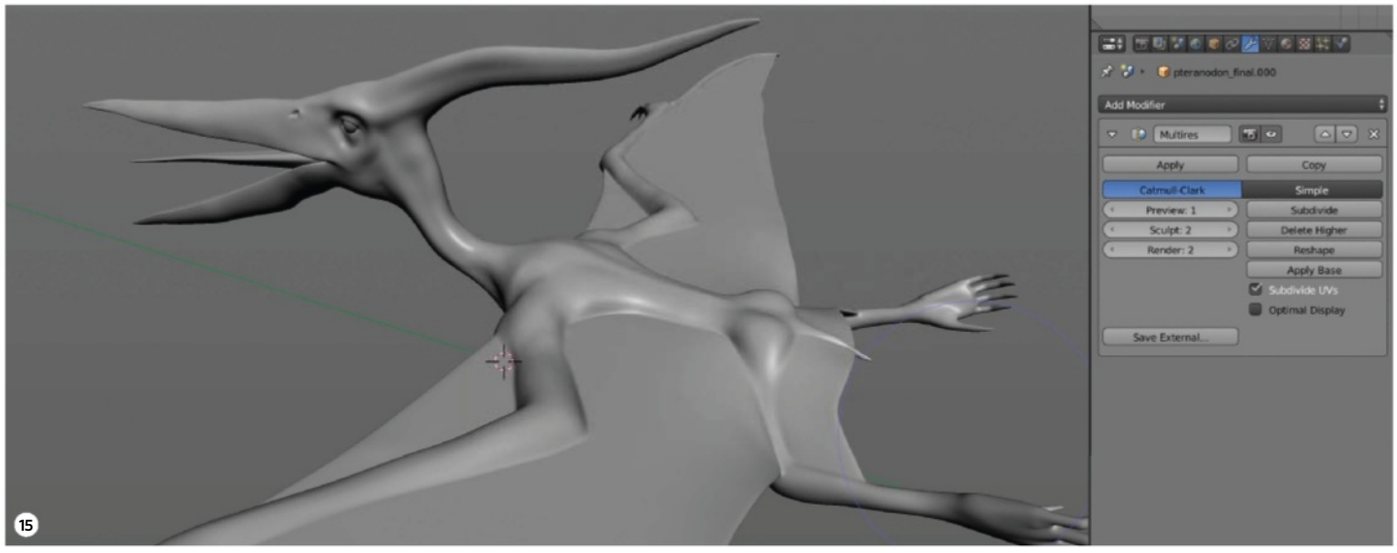
13 Unwrap the UVs Getting good seams is the most difficult part of unwrapping a model like this. Just like getting clean topology, this largely comes with practise. The goal is to place the seams in such a way that Blender can unwrap the mesh cleanly with little to no stretching. Once you're happy with the seams just hit U and select Unwrap in the 3D viewport, while the mesh is selected in Edit mode.

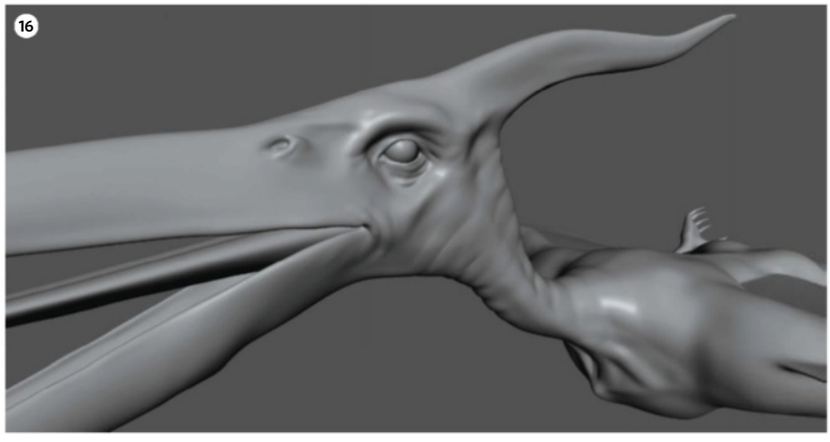
14 Fully organise the UV layout After unwrapping the mesh, Blender will lay out the UV islands how it sees best. Unfortunately, this is not always optimal. It's good to spend a bit of time carefully organising and packing all of the UV islands together in a way that makes sense to you and such that it minimises negative space. Every pixel counts when texturing, so empty space is just lost resolution. However, be sure to keep an adequate margin on the UVs or you may encounter artefacts when the texture is scaled down. Here I have organised the UVs similar to the actual model.



Detailed sculpting

Switch to sculpting to add finer features with the Multiresolution modifier





25 hours creation time
Resolution: 5,600 x 3,700

15 Add the Multiresolution modifier With the model fully retopologised and unwrapped, we can now get back to the fun stuff – sculpting detail. For the rough forms we used Dynamic Topology, which let us stay pretty loose and adjust the shape as we needed, but this time we're going to use the Multiresolution modifier. After adding the modifier, we can subdivide the model to get a good poly density. In this case I've gone up to level two, which should give us enough geometry to add the detail we need. Unlike Dynamic Topology, the modifier works in levels, so we can go up and down at any time.

16 Include skin folds Working with a variety of brushes, we can now begin sculpting the medium details into our model, including skin folds, bony protrusions and any other features you would like to add. For this detail, I often like to work with the Clay, Crease and Inflate brushes as they enable me to define lines and add volume easily. At this stage, we're working with detail but still only medium-to-large detail. Minute details such as skin pores can be added with a Bump map.

17 Sculpt muscle detail To finish off the sculpt, we'll start working in all the muscle detail. Again, this is a great time to reference skeletal structures and natural history renderings to decipher how the muscle structures may have been built. It's not necessary to go overboard on the muscles, but there ought to be enough volume to discern in the final render and to imply the strength a creature like this would have had. Next issue we'll cover the texturing, rigging and posing.

Sculpt on a high subdivision

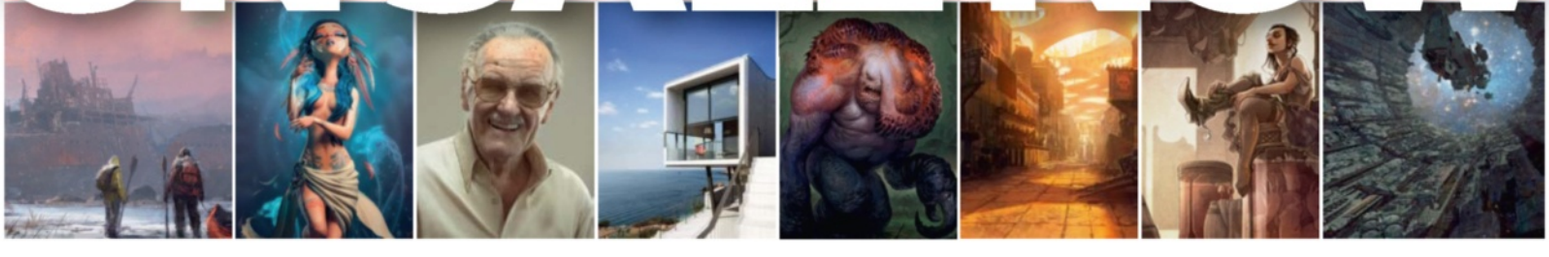
The Multiresolution modifier is great for sculpting secondary detail onto an animation-ready mesh, or simply for fixing up a posed model. However, be careful to always sculpt on the highest level of subdivision. Sculpting on any level other than the highest level with multi-res can cause nasty artefacts in the higher levels. Sculpt as much as you can on the current level before subdividing again.

• DID YOU KNOW? • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

EXPOSÉ™

VOLUME 11

ON SALE NOW



EXPOSÉ 11, the most inspirational collection of digital art in the known universe, with 587 incredible images by 406 artists from 58 countries.

www.ballisticpublishing.com

/ B A L L I S T I C /

I made this...

Incredible 3D artists take us behind their artwork

Artist info

Babak Bina
3DArtistonline
Username: ocularite

Website
www.ocularite.com
Country Canada
Software used Maya, ZBrush, mental ray, Photoshop

Portrait of Tom Waits

This image is an homage to a great artist and one of the last beatniks of contemporary music, Tom Waits. This is my attempt to translate him to the planes of X, Y and Z.

> To save on render time, try to rough out a decent-looking skin shader before loading up your textures. Only do minor tweaks after your textures are loaded. Also, try to fix your light settings before you start working on the skin

> When working on a portrait it's good practise to pay attention to the bone structure underneath the skin. Try to work on the bulky masses with the Clay Buildup brush and switch your eyes rapidly back and forth between the reference and your work

3DArtist

Masterclass

Gustavo Åhlén is founder/creative director at Enginetion. Here he teaches you how to create realistic water effects using CINEMA 4D and V-Ray

Final render composition of the water effects achieved in CINEMA 4D and V-Ray

With the Disc

Tutorial files:
- C4D file
- A water material
- Tutorial screenshots

Realistic water effects in CINEMA 4D and V-Ray

"Use multiple programs and techniques to produce hyper-real water renderings"

At present there are several methods that could be used to achieve a similar result when attempting to create water. Artists often use the most complicated process, because they're simply unaware that other methods actually exist. Really, when you break it down, it depends on the type of water that you wish to create.

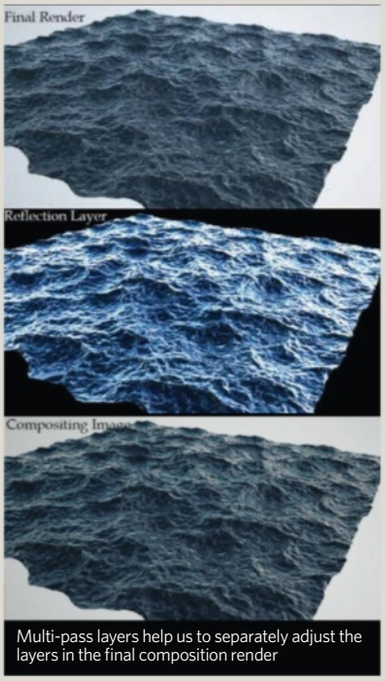
Water-based scenes have many parameters to adjust, such as HDRI-mapping, the type of lights used, the render settings, colour-mapping types, indirect illumination, the VRayPhysicalCamera settings (Film ISO, F-Stop, Shutter Speed), as well as many other variables. Remember that we're also able to use post-production to adjust the colours, contrast and any other kinds of levels to get the final render.

As such, when you start work on a scene containing a lot of water, it's important to scrutinise every value of the light materials (Refraction, Bump and so on) and then do a render of an area by selecting the space you want to preview. This way we can see how the water will look without rendering the scene entirely, which saves time.

Working in this way is useful and also necessary, as creating realistic water can require a large amount of trial and error. There is no strict rule to tell us whether all the material parameters we assign will work the exact same way when using different maps. For instance, if we add a texture map into a dome light and this texture has some green areas, it will multiply the colour of the light emission from the texture by the colour's volume of the assigned material (the Refraction layer). Consequently, in order to maintain stable colours, it's often convenient to adjust the tones used in the Refraction layer, as this will help us keep a balance between the light emission and the internal refractions, which are located in the SSS Parameters.

All materials react differently to light and numerous studies demonstrating this can be found on the internet when searching for V-Ray C4D or, alternatively, finding examples of refractive materials that are assigned different values to see how they work. Sometimes it's appropriate to create an empty document, add a new material and see how it reacts to the light. Following this, the material can be assigned to the final scene. This is just one example to understand how the different parameters can modify the final render. It's important to study materials in this way and I highly recommend doing so before commencing upon these steps.

Here we are testing different parameters in the Refraction layer, activating SSS Parameters and changing the Fog Volume



Multi-pass layers help us to separately adjust the layers in the final composition render

Take to the waves

01 Add your first object

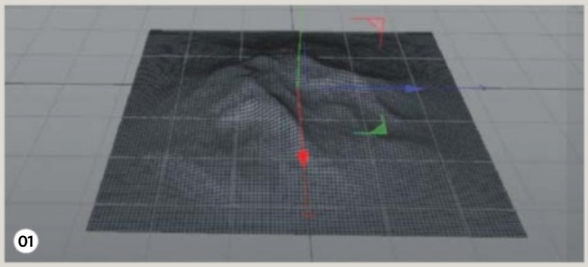
First create a landscape by clicking on the sky-blue cube in the Primitives menu. This will open the dropdown menu where you can select the Landscape option. Though you may think it would make more sense to use a plane object when working with water, rather than a landscape, I prefer to use a landscape object because it enables better control over the base mesh. This in turn enables greater flexibility, which is helpful later on in the process.

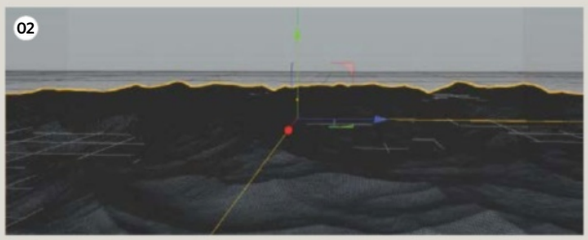
02 Edit your landscape

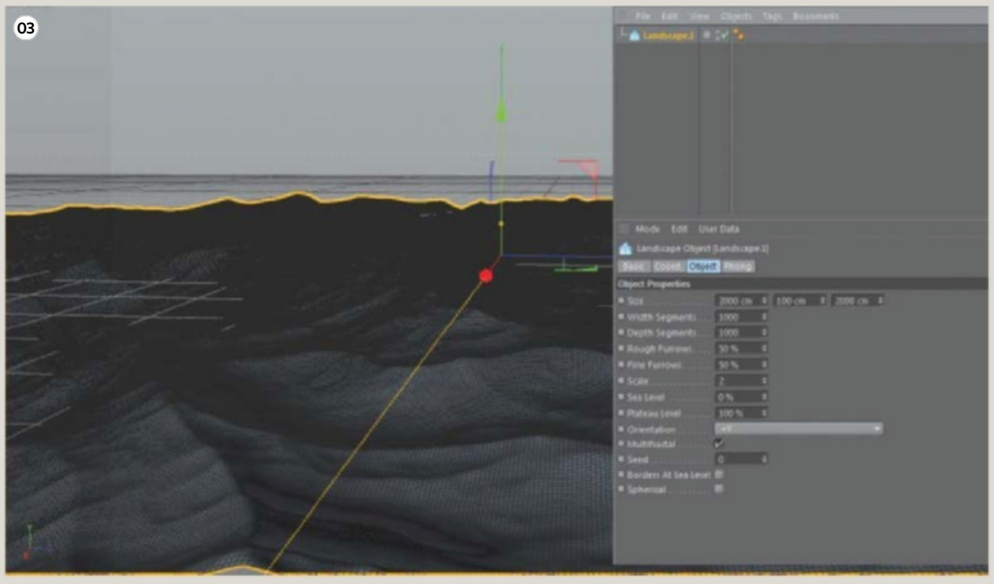
It's still possible to change the size of the landscape and the subdivisions according to the specific scene you want to make, so you don't need to feel constrained to what we're creating here. To change the subdivisions, just alter the Width and Depth segment values, but always try to keep the same proportional values for each.

03 Adjust the parameters

As you can see in the attached image, here I have changed the various Object Properties settings of the landscape object to achieve an interesting look. You can tweak these properties to your own preference, but if you wish to achieve a similar look to my work then you can find all the specific values in the 'Step 3' tutorial screenshot supplied with this issue. The maximum practical level of subdivisions we can make to the object is 1,000, so in this case I established the values of 1,000 in both the Width and Depth segments.

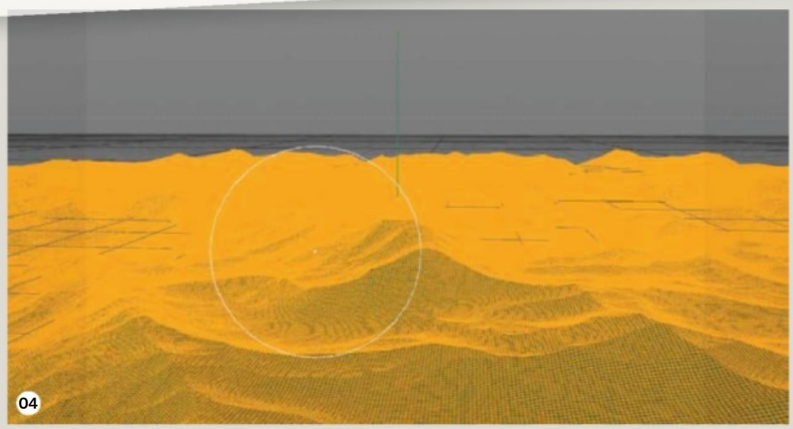


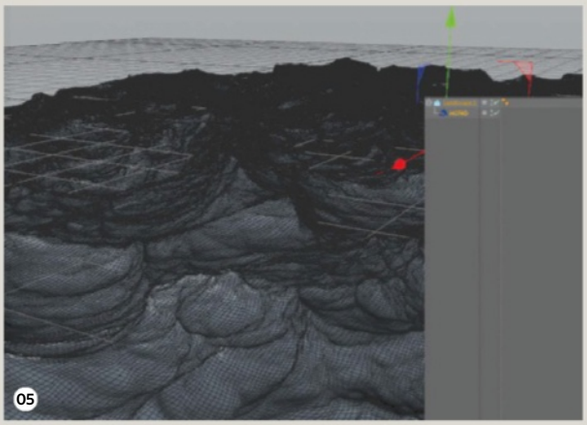




Creating various water meshes

I've tested the many different ways to create CG water, including well-known processes such as adding the tag 'VrayDisplacement' in a simple plane. Next, go to Mapping Parameters and add a texture of water or create a layer with different shaders of noise (wavy turbulence) using Multiply between them. The Texture is the map used as a Displacement map and the Amount is the value of displacement. Shift will move the displaced surface along the normal. To maintain continuity you need to create a connected surface without splits, however, you always need to use the same Bump value in the water material and Displacement map.





04 Highlight key areas

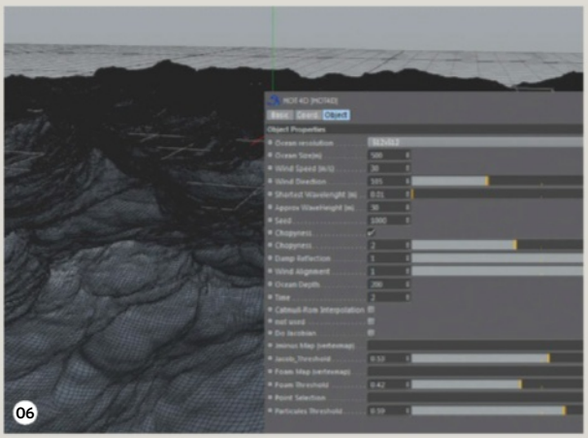
All parameters can be changed according your own preferences and there really is no rule here. You just need to think about your final scene and how you would like it to look. In some cases, if we want to lift specific areas, we need to convert the object to Editable (over the landscape object, select Make Editable), then on the left side select Polygons. Following this, select all polygons using Cmd/Ctrl+A and Ctrl/right-click over the landscape and select Brush. Using Brush, we can lift and sculpt different areas. Bear in mind that this process is perfect for static images, but is not recommended for making animations.

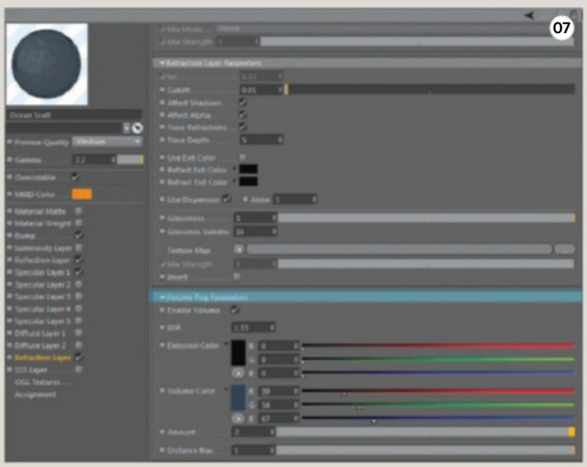
05 Add the HOT4D plug-in

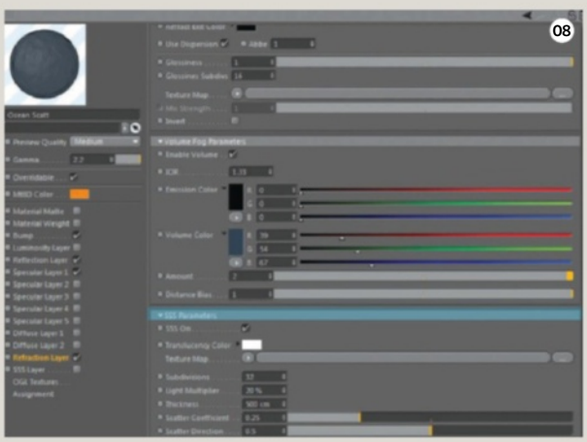
To get a more-interesting water surface, we need to add a well-known plug-in: Houdini Ocean Toolkit (Hot4D), which you can find and download at www.valkaari.com. This plug-in is extremely useful when creating water turbulence and other dynamic water effects. In this case I've not converted the landscape object to Editable as above, and have simply applied this plug-in to it instead. To do this, go to Plug-ins>Hot4D and it will create a new object called HOT4D in the Object menu. Drag and drop this onto your landscape object.

06 Adjust the plug-in

Once we have added Houdini Ocean Toolkit (Hot4D), it's time to change the default values within the plug-in depending on how we want the scene to look. Take a look at my Chopyness value and the Ocean Resolution in the accompanying image. The Ocean Resolution will determine the size area (tile) and this will decrease or increase the tile of the waves according to the landscape or plane size. You can experiment with these values. However, if you want to create an animation, you'll have to record each position separated in the timeline. Follow the values that I have used to get a similar render to what you see here.







07 Include refraction

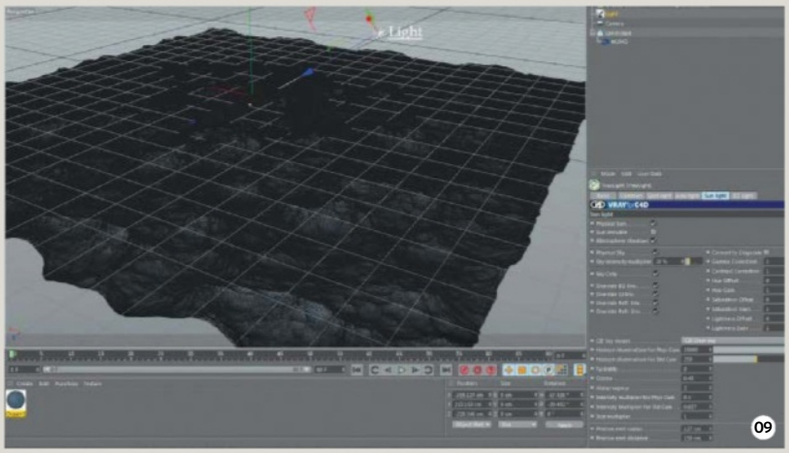
Now it's time to create a water material in V-Ray, so add VrayAdvancedMaterial into the Material menu (Create>Shader> VrayBridge). Now we need to activate the Bump layer, Reflection layer, Specular layer 1 and Refraction layer. Go to Refraction Layer>Volume Fog Parameters and change the values Amount=2 and Distance Bias=1. Altering Amount to smaller values will reduce the effect of the fog and the material will looks more transparent. Altering Distance Bias enables us to change the way the fog's colour is applied. You can make thin parts appear more transparent than normal, or less transparent. Try experimenting with different values in Emission Color, too.

08 Tweak the SSS, Specular and Bump values

Adjust the values of Light multiplier (a multiplier for the translucent effect), Thickness (to limit the rays that will be traced below the surface) and activate Environment Fog. Now we need to adjust the values of the Specular layer, so activate Specular Layer Fresnel (1.33 water). Go to the Bump layer, create a new layer and add three layers of noise into it (for wavy turbulence). You can use the file 'Ocean Scatt' supplied with this issue and check out the layer values used for this tutorial.

Water refraction and specularity

Creating the water material is one of the most important steps, because it will determine the realism of the water above the waves previously created as simple meshes. When you make water material it's vital to pay attention to the Volume Fog Parameters of the Refraction layer. Not only does the realism of the water depend on the material, it also depends on the light used, the Specularity and other values that compose the scene into V-Ray.



09 Compose the scene's lights correctly

It's now time to add a little bit of illumination to the scene, so click on the light object, which will add a new light in the Object menu. Now Ctrl/right-click over the light and select VrayBridge Tags> Vraylight. After adding the Vraylight tag, you will see a new, small, yellow icon on the right side of the light object, so select it. In the Common tab, set Light Type=Infinite, then go to the Sun Light tab and tick Physical Sun and Sky Only. If you want to use the other exact parameters used here, check out the accompanying screenshot.

10 Adjust the camera

Now add a camera object, click on it and follow the process of the previous step, but this time adding the Vraybridge tag 'VRayPhysicalCamera'. Following this you also need to change the values in the VrayTag camera according to how you want the render to look. Once you have adjusted the values of Film ISO=100, F-Stop=3 and Shutter Speed=200, I recommend that you test some different values and render various scenes to see how they could look. Pay attention to the next steps about colour-mapping, because they will help you to see a correct colour preview before you make test renders.

11 V-Ray settings

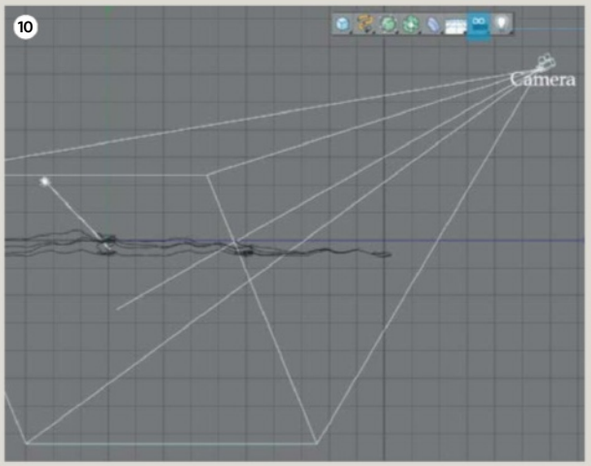
V-Ray settings enable us to configure the Color Mapping, antialiasing, GI, DMC sampler and so on. In Color Mapping I prefer to use Reinhard – Multiplier=1 Burn=0.6 and Gamma=2.2. Don't forget to activate LWF. Under Indirect Illumination (GI) – I've used an Irradiance map and light cache. If you want to run some materials tests, I recommend decreasing – temporarily – the values of Hemispheric Subdivisions, because it enables us to control the number of GI samples. More often I use a value of 50. The DCM sampler is set by default. You can check out all the parameters used in this scene in the C4D file available with this issue.

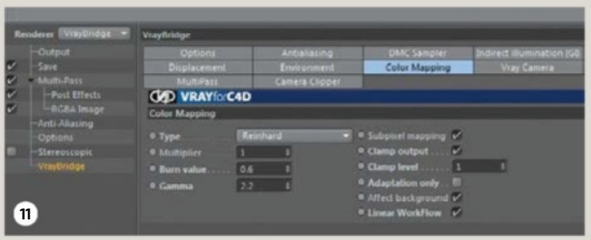
12 Move to post-production

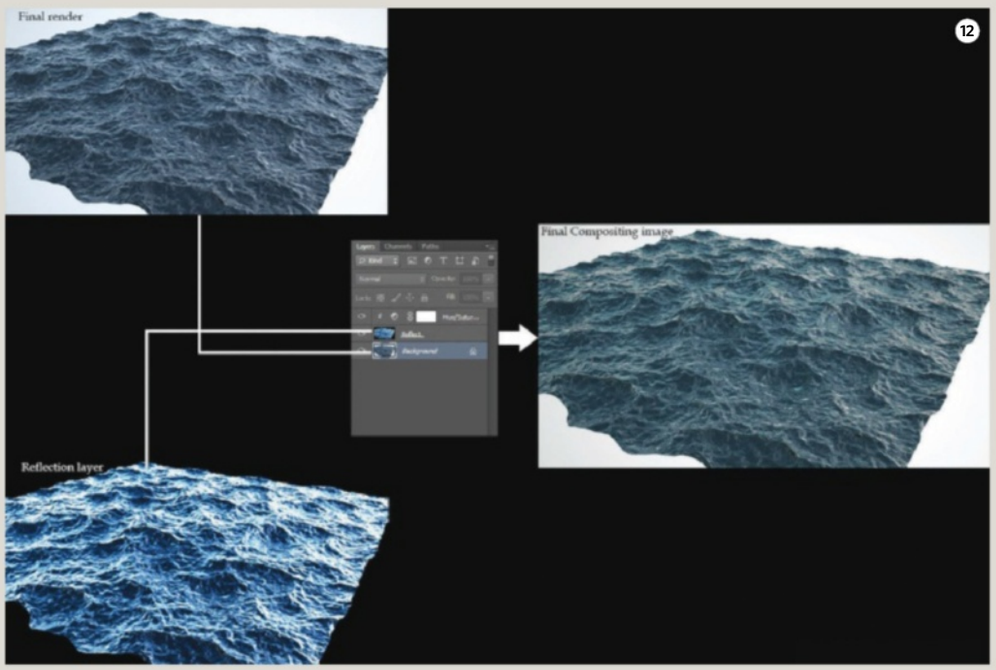
The post-production process is very important, because if your final render looks a bit too blue, red or green, we can change these values using our preferred software. For animation we can use After Effects, NUKE, or Fusion to change these parameters by adding various filters. For static renders I recommend using Photoshop, which is excellent for controlling the different colour levels. We can also add more contrast to our scene or change the colour values of all the separated channels. If your render doesn't look exactly how you expected, just follow the processes previously mentioned, testing different values until you get a truly realistic scene. Also, don't forget to recalibrate your monitor, using Gamma 2.2.

The best lighting and water material properties

The SSS Parameters options are vital for creating a scene just like this, as these values are the ones that control how the light passes through the water itself. It we don't activate the SSS, we will only see a uniform water. However, when using this feature we can see a subtle variation of depth through the surface. As you will be able to tell, in some areas the material looks darker and in other areas more transparent. You can adjust these values according to how you'd like your scene to look. If you change the textures used to illuminate the scene – the HDRI dome light, for instance – you will notice that the water colour changes. You can control the lighting texture by adding a filter.







• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

3DArtist

Back to basics

Jahirul Amin looks at how we can add subtle touches of life to bring an energy into and exterior scene

The final image after adding all extra elements to the scene

With the Disc

Tutorial files:

- A Maya project directory ('project_environment') with all the scene files and more

Bring an exterior Maya environment to life

"The following steps will guide you through bringing a lived-in atmosphere to an otherwise static environment"

In the first two parts of this tutorial series we have modelled, textured and shaded an environment. In this final part of the series we'll work to bring life to the scene by adding some animation and also including some new animatable assets. We'll also lend the scene a real lived-in look by dirtying it up and speeding up its aging process a little.

So, what elements can we pick out in the scene to inject a little reality? Of course, the bunting and the foliage are ideal features to work on. With the bunting we'll be using Maya's nCloth tools to create the illusion that there is a breeze blowing along the street. For the foliage we'll be utilising the animatable parameters of Paint Effects to give the impression that the wind is gently swaying the leaves.

Another new feature that will serve to add more vibrant effects is the creation of the world beyond the street, as seen through the gate in the tower. Here we'll use Paint Effects once more to make a field of tall grass stretching into the distance.

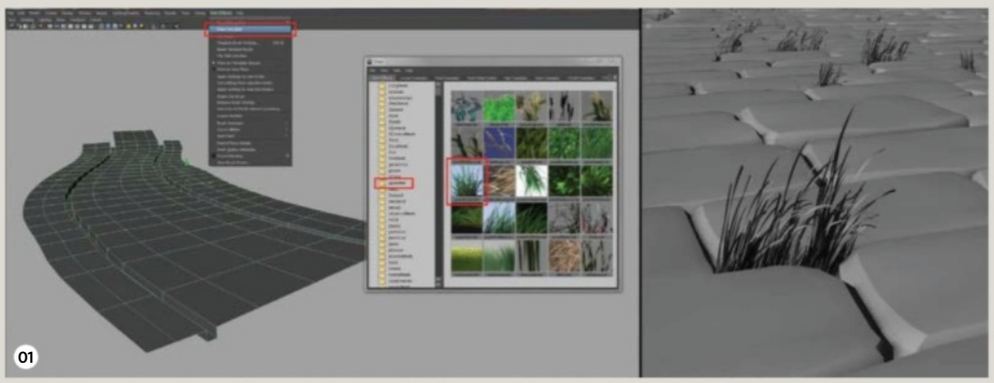
Previously the street looked a little too IKEA, so we'll also add some grass between the cobbles and to the ground using Paint Effects. We'll also include a few loose stones on the street using basic polygonal modelling. These additions seem very minimal on-screen but they bring a lot of character to the environment.

Regarding lighting, I felt that last month's render was too sharp, so I wanted to soften the air and round off a few harsh corners. We can achieve this using volumetric light effects. Naturally, this adds a lot of time to the render but I think the results are worthwhile when compared to using something like a ZDepth pass.

Our last major addition will be to introduce some clouds using the emfxCLOUDS tool by Emmanuel Mouillet. This enables us to get a softer transition between our CG clouds and the HDRI and they can also be animated later.

Testing out the volumetric lighting effects to see what will work best

Where we started and where we left off last month


01

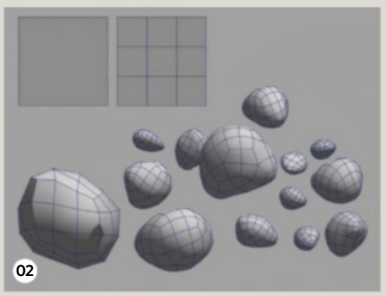
Flags fly and grass dances...

01 Make the grass grow

First, we need to add in some detail to the street, as it currently looks a little too clean to be real. Export out the ground from where we left off last time ('01_start.ma') as an MA file and open it up into a new scene. Go to Create>Polygons>Plane, use the modelling tools to roughly match it up to the cobbles, then go to Create UVs> Automatic Mapping. Next switch to the Rendering module by hitting F6 and, with the plane selected, go to Paint Effects> Make Paintable. Now open up the Visor found under Windows>General Editors and scroll down to the Grasses sub-menu. To add small pockets of grass between the bricks, I used the grassClump brush and modified some of the settings until the right results started appearing.

02 Convert Paint Effects to polys and add stones

Once you have painted grass around the scene, select all the strokes and go to Modify>Convert>Paint Effects to Polygons. This enables us to render them in mental ray. Export out the grass as an MA file and we can add it to the main scene later. For the stones, take a simple polygon cube, add some extra divisions and then use the Sculpt Geometry tool, found under Mesh in the Polygons module, to push and pull the geometry around. By simply duplicating, scaling, rotating and making small tweaks, you should be able to quickly generate a series of stones that you can scatter around the scene. Once you have the stones positioned correctly, again export them out as MA files.


02

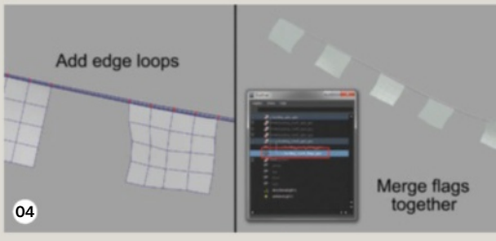
03 Build up the background fields

Like we did with the grass, we can do the same again for the fields behind the tower. First create some geometry to act as a paintable surface, give it some UVs and then, using a modified fieldGrass and Straw brush in the Visor, begin painting over the areas that will be seen from the main camera. The good thing about using the fieldGrass brush is that it also animates by default, so we can create some minor movement in the background to keep the scene alive. Hit Play to view the results yourself and once you're happy, convert the strokes to polygons and export them out.

03

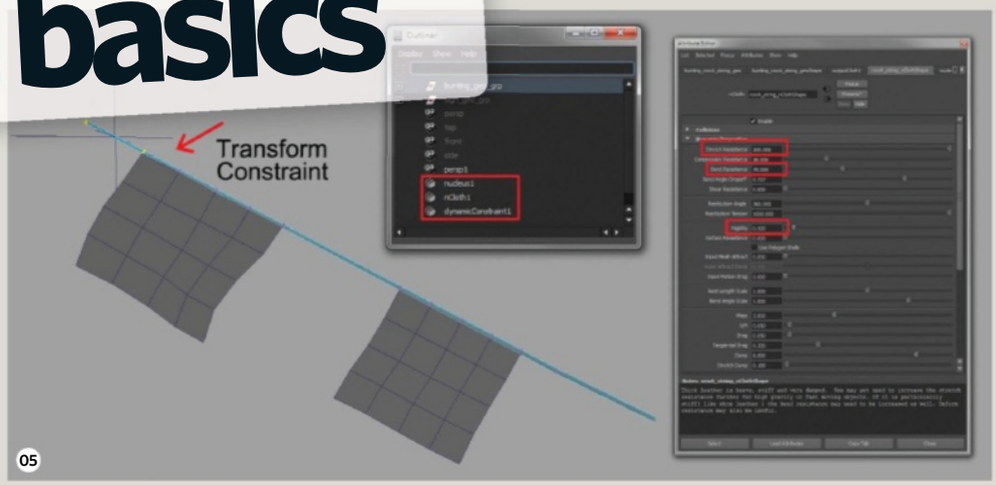
04 Prepare the bunting

Now export the bunting from the main scene into a new scene. To constrain the flags to the string, we'll need to add some extra edge loops so when all the bunting elements are converted to nCloth, the flags won't simply blow away. With the string selected, use the Insert Edge Loop tool to add loops where the edges of the flags meet the string. Next, select the string and go to Edit>Delete By Type>History. Select all the flags (one row at a time) and go to Mesh>Combine so we have a single geometry. This will enable us to only require one nCloth node per flag set, as opposed to each flag having its own node.

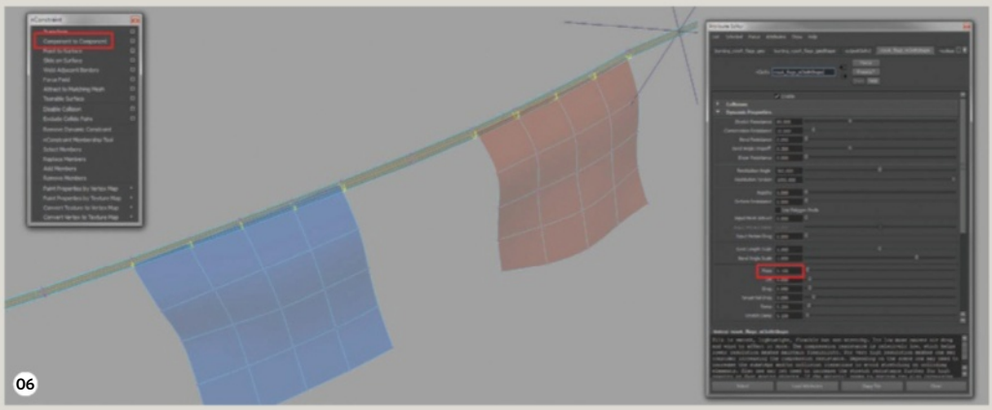


04

Back to basics

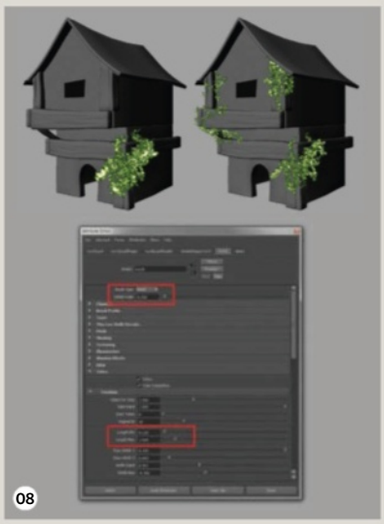


05


06

nCloth caching

When testing out nCloth, make sure your Animation Playback Speed is set to Play Every Frame, Free. I use playblasts to view the results during testing and then use Caching to bake in the results. To do this, with the geometry selected, go to nCache> Create New Cache (Options). Select a directory to drop the files off and set the File Distribution to One File or One File Per Geometry if you have multiple objects selected. Hit Create and you should now be able to scrub through the timeline freely. If you need to edit the settings of the nCloth, you need to go to nCache>Delete Cache and resimulate the results.

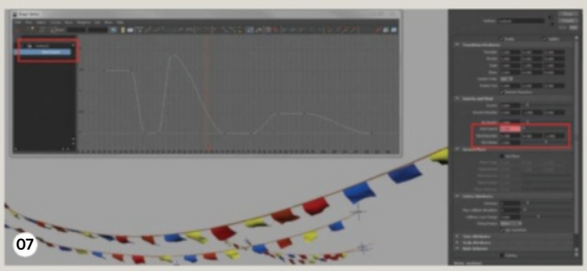

08

05 Use nCloth for the string

Make sure you are in the nDynamics module and, with the string selected, go to nMesh>Create nCloth. You should see in the Outliner that a nucleus1 node has been created, as well as an nCloth1 node. Before playing with these settings, let's pin the string to stay in place. Select the vertices on one end of the string, go to nConstraint> Transform, then do the same to the other end. Hit Play and you should see the string is now firmly pinned on both sides. Select the nCloth1 node and go into the Attribute Editor. In the nClothShape1 tab, from the Presets menu, select thickLeather. Experiment with the Dynamic Properties a bit to get the desired results for the string that is pinned down, rather than flowing freely. I ended up increasing the Stretch Resistance to 200, the Bend Resistance to 70 and the Rigidity to 0.5.

06 Constrain the flags

Now select the flag geometry and go to nMesh>Create nCloth. To constrain the flags to the string, we'll need to use the Component to Component constraint. In Vertex mode, select all the points at the top of each flag then, with those points still selected, go into Vertex mode on the string and select the points that are close to the


07

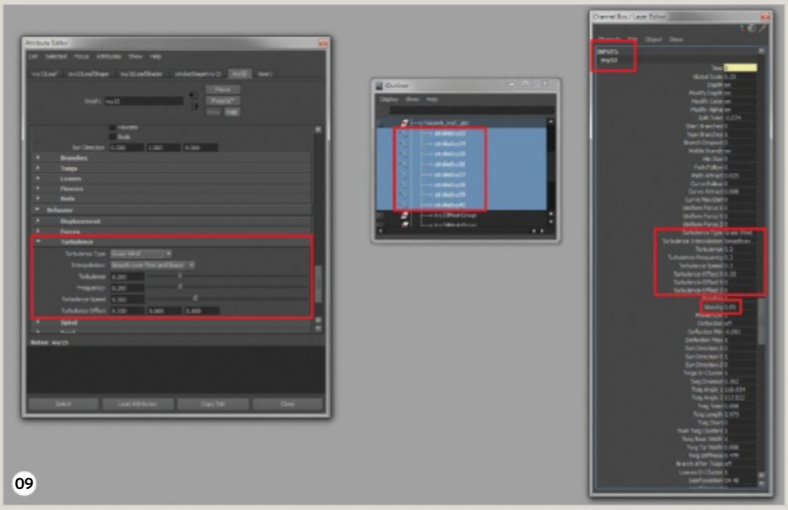
points of the flags. Once you have all the required vertices of the flags and the string, go to nConstraint>Component to Component. Now hit Play to test if the flags stay on the string or if they fall off. You can then experiment with the Dynamic Properties of the flags to achieve the correct behaviour. I began with the silk preset and then decreased the Mass to 0.1 for the final results.

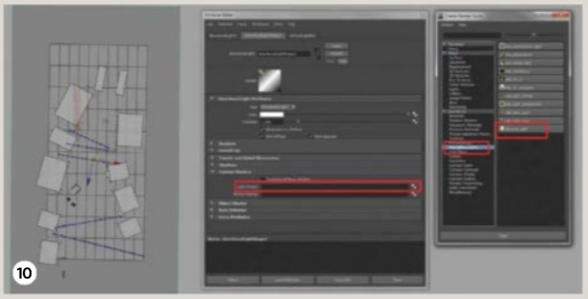
07 Create some wind effects

To add some life to the scene, let's get some wind blowing through the flags. We could simply play with the various fields here and add them to our scene, but instead in this case I opted to use the Wind Speed attribute that lives under the Gravity and Wind tab on the nucleus1 node. By using this attribute I could affect all the cloth elements in the scene in one hit. To replicate this, first we need to set the Wind Direction to 0.2, 0.2 and -1. This pushes the cloth mainly in one direction, but also gives some subtle movement from other angles. Now set some keys on the Wind Speed to adjust the amount of wind affecting the flags. Finally, increase the Wind Noise to 2 to add a bit more randomness to the wind. Once you're happy with the results, repeat the steps for the remainder of the bunting and export them ready to go into the main scene. The same method can be used to make the pub sign swing to and fro.

08 Work with the ivy

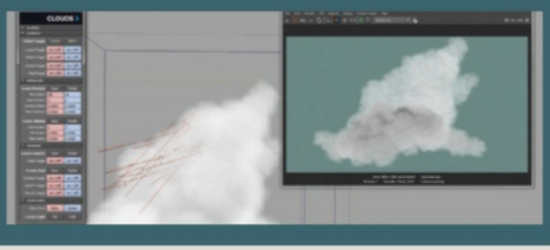
It can be pretty tricky to get some movement out of the ivy we created in the first part of this series. To get around this issue we can re-create the ivy using Maya's Paint Effects. One by one, export out each building that needs ivy, merge all the building parts together, then delete all the parts that don't have ivy growing on them to make them lighter. Next, use Automatic Mapping for the UVs so you can use the house as a paintable object. With the Ivy brush preset found under the plantsMesh tab in the Visor, draw strokes over the areas of interest. You'll find that the initial results create very large leaves, so edit the settings to get the best results. Once you're happy, with the outcome, save the preset and then apply it to every other stroke being used. I ended up taking the Global Scale down to 0.25 and in the Creation menu, under Tubes, I decreased the Length Min to 0.125 and the Length Max to 1.

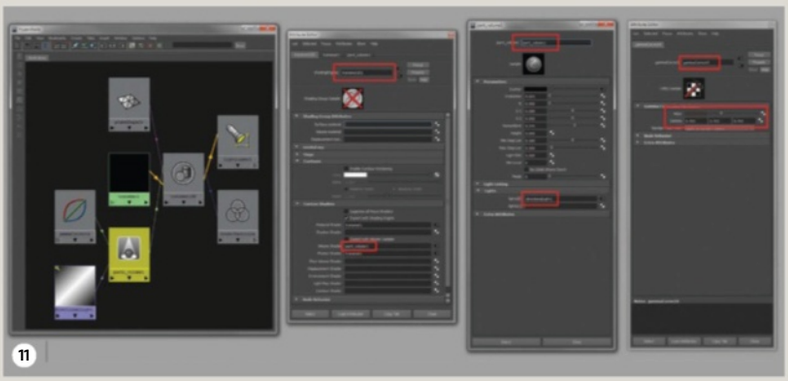




Adding clouds

I wasn't too impressed with using images for the sky, as I felt they didn't quite gel with the foreground elements. To overcome this, I used the very awesome cloud-generator tool, emfxClouds by Emmanuel Mouillet (**www.emfx.fr**). He has an in-depth video on how to install and use the tool, so you should be able to pick it up easily. I created a set of four clouds in a clean Maya scene and then imported and duplicated them into the final scene to fill the sky. To light these clouds, I decided to use Light Linking so the image-based lighting node and the directional light didn't affect the clouds. Using the lighting options within the tool was enough to create the results.



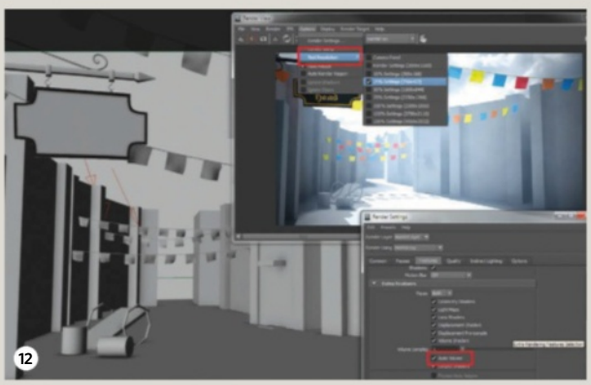


09 Add energy to the ivy

To get some minor movement from the ivy we can use the Turbulence settings, which you will find in the Behavior tab. I changed the Turbulence Type to Grass Wind, the Interpolation to Smooth Over Time and Space, the Turbulence Speed to 0.3 and the Turbulence Offset to 0.33, 0 and 0. I also increased the Gravity to 0.5 in the Forces tab so the ivy hangs down slightly. If you edit the settings in the Attribute Editor, you will find that you can only edit one stroke at a time. Instead, select all the strokes and, in the Channel Box, open up the Ivy node in the Inputs and scroll down to the Turbulence section to affect all the selected strokes. Make sure you experiment to see what suits you and create Playblasts to compare the results. Once you have the desired results, convert the strokes to polygons and export them out ready to drop back into the main scene.

10 Use volumetric effects

Currently the air is very clean, so let's add some volumetric lighting to spice things up. Create a low-resolution representation of the houses and the tower by using simple cubes. Export these objects along with the current lighting setup ('mentalrayIbl1') and the main camera into a new scene for testing. You can also export the flags and the sign for testing. Create a poly cube and scale it so it surrounds all the buildings. This will act as the volume for the effect. Next, create a directional light and open up the Custom Shader found under the mental ray tab. Click on the chequered icon to the right of the Light Shader and plug a physical_light node into it. To begin with, set the Color values of the physical_light to something between 10 and 15.



11 Include more nodes

Next, go to Windows>Rendering Editors>Hypershade and create two nodes: a transmat from the mental ray>Material tab and a parti_volume from the mental ray>Volumetric Materials tab. Select the transmat1SG (the shading group) and middle-mouse-drop the parti_volume1 node onto the volume shader attribute of the transmatSG1. Next apply the transmat1 material to the cube, acting as the volume in our scene. Select the parti_volume1 node and scroll down to Lights under Light Linking, then drag and drop the directionalLight1 here. Finally add a gammaCorrect node to the Scatter attribute on the parti_volume1 parameters and set the gamma to 0.455, 0.455 and 0.455. We can now use the Value on the gammaCorrect node to set the colour and the amount of light coming through.

12 Finalise the effects and unify the scene

Open up the Render Settings, scroll to the Features tab and, under Extra Features, make sure Auto Volume is turned on. Hide the mentalrayIbl1 node and do some test renders. Within the Render view, I'd advise using the Test Resolution settings under the Options to speed up viewing the results. I was aiming for something quite subtle here, so I ended with my gammaCorrect Value set to H: 211, S: 0.176 and V: 0.072. I also set the Extinction 0.002 and the Nonuniform to 0.545 on the parti_volume1 node and the Value to 12.5 for the Color on the Directional Light. Once you are happy with the effects achieved, reveal the mentalrayIbl1 node and tweak the settings if needed. Finally, it's a case of importing all these elements back into the main scene file and, again, simply tweaking the lighting until you get the right outcome. Good luck and happy rendering!

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

3DArtist Questions & answers

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk

Need help fast? Join the

The advisors

3ds Max
Gustavo Åhlén
www.gustavoahlen.com

Gustavo Åhlén is the founder and creative director at Enginetion. He is also a professional 3D and VFX designer for various films, videogames and advertising projects

NUKE
Dave Scotland
www.cgswot.com

With over 12 years of production experience, Dave has worked for some of the biggest clients in the industry including Disney, Warner Bros and Plastic Wax

ESTIMATED TIME TO COMPLETE THE TUTORIAL
15 MINS

With the Disc

Tutorial files:
- Building Model.max
- Video tutorial

3ds Max

Smash glass with RayFire

How can I create a smashing glass effect in RayFire?

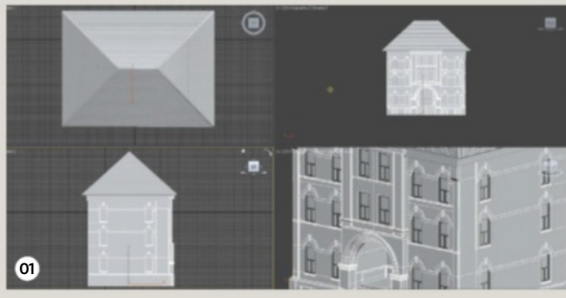
There are many different effects on show in Hollywood films, from explosions to shattering glass. It's the chaotic side of CG that draws many towards the discipline.

There are many tools that enable us to create fragmentation effects in 3ds Max, such as the use of the Fracture Voronoi script. However, in this particular case we will focus more on using RayFire, as it has more options for fragmentation than most other plug-ins. This enables more precise calculations over the surface destruction, as well as offering better control over fragmentation types.

RayFire is a plug-in that works with the unified physics simulation framework MassFX and was introduced into 3ds Max 2012. Although based on the PhysX SDK, MassFX has replaced the old Havok Reactor physics engine. Unlike Reactor, MassFX can perform simulation directly in viewports, which is extremely helpful.

A key point to pay attention to when working on projects such as this is the various Fragmentation Types in RayFire. This is one of the key parameters that will have a huge effect on the final result. For instance, if you destroy a rock, an inappropriate type of fragmentation would be bricks. I recommended trying blocks, or primitive cubes, with different types of fragmentation that RayFire offers. This way you can understand what the best option is for your effect, according to the material that you want to destroy. Remember, the object fragmentation will turn in new clusters and we can control these clusters using modifiers.

In the RayFire menu you can also find the Objects tab, where you can add different types of objects used in VFX RayFire animations. In the Objects tab, you will find Dynamic/Impact objects are used to receive collisions, while Static and Kinematic objects are used to destroy surfaces. You will also see Sleeping objects, which remain inactive without the influence of Gravity until they receive the collision or explosion. After this, you will notice the Physics tab, where you can add Helpers such as an RF Bomb.



RealFlow

Matteo Migliorini
www.art2upz.com

Matteo is a CG artist/supervisor with ten years of experience. He specialises in fluid, particles and dynamic effects. He has also worked in the architectural industry

Send us all of your 3D problems and we'll get them sorted. There are four methods to get in touch with our team of expert advisors...

Share your woes

3dartist@imagine-publishing.co.uk
facebook.com/3DArtistMagazine
@3DArtist www.3dartistonline.com

01 Make a mesh

To arrange the composition of the scene, first create a mesh model to add the explosions and destruction over. Here I've modelled a house in order to destroy all its windows. You can find this model supplied with the issue. Using this example you will discover the basic parameters of RayFire and how we can use the options of Objects, Physics, Fragments and so on to create a visual effect scene. Now open the attached scene named 'Building Model'.

02 Understand Thickness

The Thickness of an object plays a key role in the final outcome of your simulation. To see the effects of Thickness in action, go to Create>Geometry>Standard Primitives and add a cube with low Thickness (Height=1) and after this add a simple plane. Select both objects and go to Create>Geometry> RayFire>Open RayFire Floater, click on the Objects tab and go into Dynamic/Impact Objects. Click Add, then go to the Fragments tab and select Fragmentation Type=Voronoi Uniform (10 – 5).

03 Separate the windows

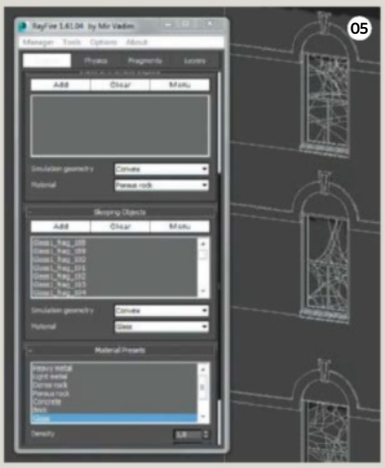
We need to separate the windows from the rest of the model, otherwise the entire building will smash apart in the simulation. In the attached file 'Building', the windows are already added as separate objects, so select one, right-click and click Select Similar. Open RayFire Floater and click on the Object tab. Click on Add, go to Fragment and use Fragmentation Type=Voronoi – Uniform, Iterations=10 – 5 and click on Fragment. This way the windows will all be broken in different fragments (see the orange frame in the accompanying screenshot).

04 Add an RF Bomb

Now add an RF Bomb by going to Create>Helpers>RayFire>RF Bomb. Centre the RF Bomb in the middle of the house so the explosion can eject the particles from the inside out. With the RF Bomb selected, go to Modify and change the values to Frame=10, Chaos=50 and Range Type=Unlimited Range. Open RayFire Floater, go to Physics>Simulation Properties and add RF Bomb. In Physical Options, change the Gravity to 1.8.

05 Keep the objects in place

If we leave the fragments created in Dynamic/Impact objects as they are, Gravity will act on them as soon as we start the animation at frame 1. So, if the RF Bomb starts at frame 10, these objects will fall during the first ten seconds from their original position. To keep these fragments in their original position for the opening frames, go to RayFire Floater> Objects tab>Dynamic/Impact Objects, click Menu and hit Send to Sleeping List. Under the options for Sleeping objects, change Material to Glass and select Glass in the Material Presets.



06 Complete the destruction

Hit Preview and see if you are happy with the simulaton. Once you have a good explosion and good interaction between clusters, it's time to bake the animation. The preview only shows how the simulation looks, but does not record each frame. To record every interaction so you can render it, we need to bake the scene. Hit Bake and each frame will be recorded in the timeline, so you can then render the animation. Go to Rendering>Render Setup>Common, tick Range and set 0 to 100.

Parameters in RayFire

One of the most important points to keep in mind when creating an effect like this is the type of material that we want to break and the strength of the explosion. If you want to create a sequence of explosions, just add a series of RF Bombs at different frames. However, in this particular case, you would have to use a Linear Range with a high Strength value. Other types of destruction can be achieved by adding an object into RayFire Floater>Objects>Static & Kinematic Objects and making it collide it against the fragments.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk

ESTIMATED TIME TO COMPLETE THE TUTORIAL
45 MINS

With the Disc
Tutorial files:
- ASX_Still_720-HD_EXR.exr
- MultipassCompositing_Start.nk
- Video tutorial

NUKE

Composite multi-pass renders in NUKE

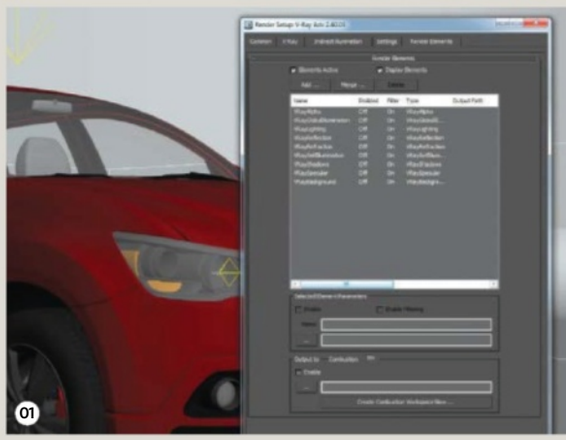
"How can I quickly and effectively composite 3D multi-pass renders in NUKE?"

To get the most power out of any post-production process, it always comes down to the assets. Whether it's evenly lit greenscreen elements, smooth plate photography or noiseless footage, the better the assets, the more power you have in post. With good assets, you increase the efficiency of the process and even add more creative possibilities. This is especially true when it comes to CG-rendered elements.

Let's say you have a beautiful 3D scene and you've rendered it out using your chosen renderer. The render took hours or even days, but compositing it is reasonably straightforward. It's all coming together quite nicely when the director asks for warmer shadows and to tint the main colour of one object. If you only rendered the scene using a single Beauty pass, then it's back to 3D and a whole new render.

However, if you rendered your scene using multiple passes, which isolates the various render elements, the director's requests could be implemented in mere minutes – in addition to including some experimentation to bring even more creative punch to the scene. Put simply, multi-pass rendering is the ultimate tool for providing maximum power in post. The more you can avoid having to go back to the 3D application or the render farm, the more efficient and creative you can make the post-production process.

Over the next few steps we'll be exploring the compositing process required to work with multi-pass render layers in NUKE. We'll take a look at the important layers to include in your renders and how to evaluate them in NUKE once rendered. Next we will go through the process of correctly layering the passes and how to make changes to single elements. We'll also take a look at one of the alternative methods for compositing these passes.



01 Choose the right passes

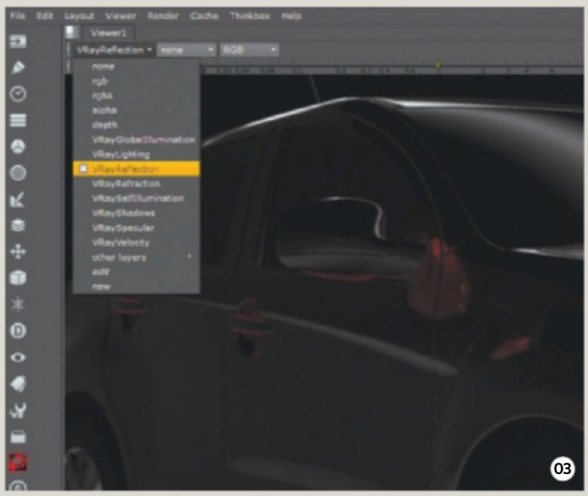
When rendering out of your 3D application, it's important to include all of the passes you're going to need. The goal is to re-create the beauty or RGBA render, using all of the elements, layered in NUKE. For example, if you have some reflection in the scene, you'll need to include a Reflection pass. You won't, however, need to include render passes for elements that aren't present in your scene. So, if you have no refraction at all, you won't need a pass for that. The other important thing is to render to a file type that supports multiple channels of information, not just RGBA.

Not all renderers are created equal

There are some subtle differences when using after-market or third-party renderers. A good example is V-Ray, as while you can do a simple channel setup using the basic render elements available in V-Ray, you can also use a series of RAW and Filter passes. You still use the Merge method for compositing them together, but there are some extra steps that are needed in order to match the Beauty pass render. So, this system gives you more control in post at the cost of extra work.

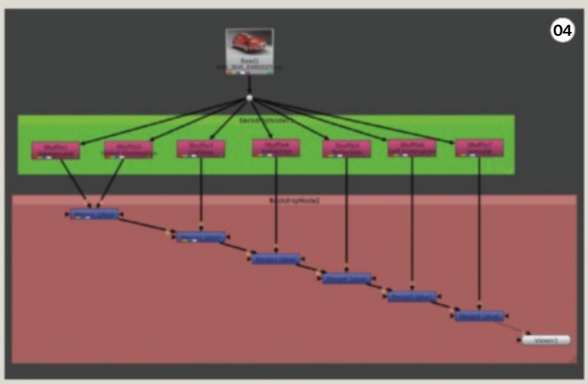
02 Make use of the Layer Contact Sheet

So, you've rendered your scene and included all of its various elements separated into various channels. You've also imported the render into NUKE using the Read node. What now? The best place to start is to assess and confirm which passes came with the render and what they look like. NUKE has a fantastic node just for this process, called the Layer Contact Sheet. It takes all of the render passes or channels, which are included in the file and presents them as one visual table.



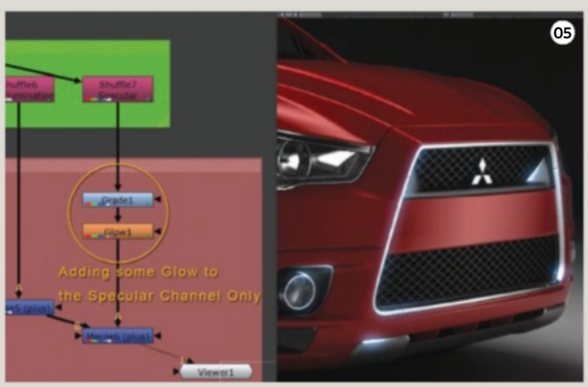
03 Preview the passes

The Layer Contact Sheet node is great, but what if you want to check your elements in more detail? For this we'll need to use the Channels section of the Viewer panel. Render elements are simply extra channels stored in the channel buffer of the file and can be explored by using the drop-down list, located in the top-right section of the Viewer. You can also use the Red, Green, Blue and Alpha channels to really study how the render elements have been created. Now a series of Shuffle nodes linked to your image is all you need to extract the passes, ready for the next step.



04 Layer the elements

The process of layering the passes involves a heavy use of the Merge node. The standard A-over-B system is used, although, rather than using the Merge set to Over, it's set to Plus. The most important part of this process is getting the order right. A system that often works well is Background plus Global Illumination, plus Light or Diffuse, plus Refraction, plus Reflection, plus Self Illumination and finally with Specular added. This is a good basic layout and you should be able to match the Beauty pass from your 3D application.



05 Control the elements

The purpose of creating this pipeline is for greater control over the individual elements in the scene. Once the passes or channels have been correctly layered, you can start correcting or improving the scene by adding various nodes. You can tweak the colour of one element while tweaking the opacity of another, all without having to re-render the scene in 3D. You can even add various object or material ID channels to your render, which are great for isolating objects or sections of your scene.

06 Try an alternative

There are various ways you can layer the render elements in NUKE. However, they are simply variations on the same Merge technique. Which method you use is entirely based on personal preference. NUKE's architecture is great for manipulating the Node Graph to better represent your workflow and the image's journey down the stream to the final Write operation. Establishing practical naming conventions while you work is key, as well as exploring the many ways you can set up you nodes within this process. The ultimate goal is greater control over your render elements.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

3DArtist Questions & answers

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk

With the Disc

Tutorial files:
Matteo has supplied his RealFlow 2012 scene file, along with other resources to help you follow his steps

RealFlow raindrops

"How can I create a raindrop effect running down a window in RealFlow 2012?"

ESTIMATED TIME TO COMPLETE THE TUTORIAL
3 HOURS

RealFlow is definitely a great software for simulating fluid dynamics, but examples created using the software are often limited to simplistic effects. However, used properly, it can deliver some fantastic results. For instance, here we're going to take a look at how you can use the software to quickly and easily create the effect of raindrops trailing down a window pane.

There are workflows in other applications that allow for better management of such projects (such as Particle Flow in 3ds Max), but I believe it's beneficial to explore the various methods also available in other software, and RealFlow offers a great simulation-based alternative in this regard.

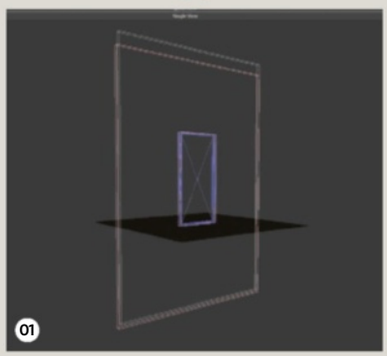
The technique I'm demonstrating here is very simple and doesn't require advanced knowledge. In fact, this solution requires no Python scripting and we're only going to utilise basic tools, ensuring a flexible and simple process that should be quite easy to follow.

Important details, such as the rain outside in the background, can be created through basic particle systems in 3ds Max and a massive amount of post-production with After Effects, if you wish to add it. If you want, you can even simulate the rain with an Emitter bitmap inside RealFlow, but this is a much longer and more complex calculation.

We don't have time to delve into the full rendering workflow here, as it's not the focus of the tutorial, but the techniques used are basic and easily replicable elsewhere. For the final render seen above I used 3ds Max and V-Ray, but an HDRI technique is also very fast and could be a solution for our purposes. For post-production you can usually finish in After Effects, as it's the most intuitive software for those starting out in CG.

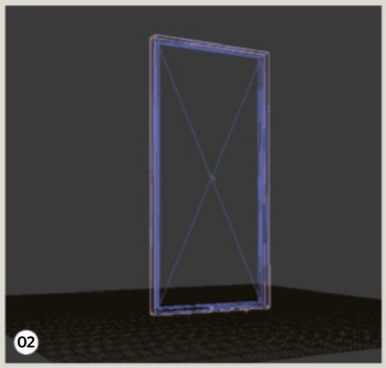
So, over the next few steps you will learn how to organise your files using the logic of exclusive links to enable greater control over fluids. Specifically, various Daemons will have to act differently and exact their influences across the scene.

Supplied with this issue you'll find various RealFlow 2012 files to aid you in your work. These will enable you to follow the tutorial step by step, and to see how I achieved the final result.



01 Import and organise the scene in RealFlow

First you need to establish the structure of the file, so you'll need a Particle Emitter (object) and a few Daemons (K_Volume, K_Speed, Gravity and Drag). Import the 'geometry windows_tut.sd', create a K_Volume as big as the wall and position it behind the window, however, you will have to invert its function to be effective (rename it 'KV_SAFE_AREA'). Next, create a second K_Volume (renamed 'KV_WINDOW') to be as big as your window. To simulate the severity of the real world, you'll next need to create a Gravity force.



02 Set up the exclusive link

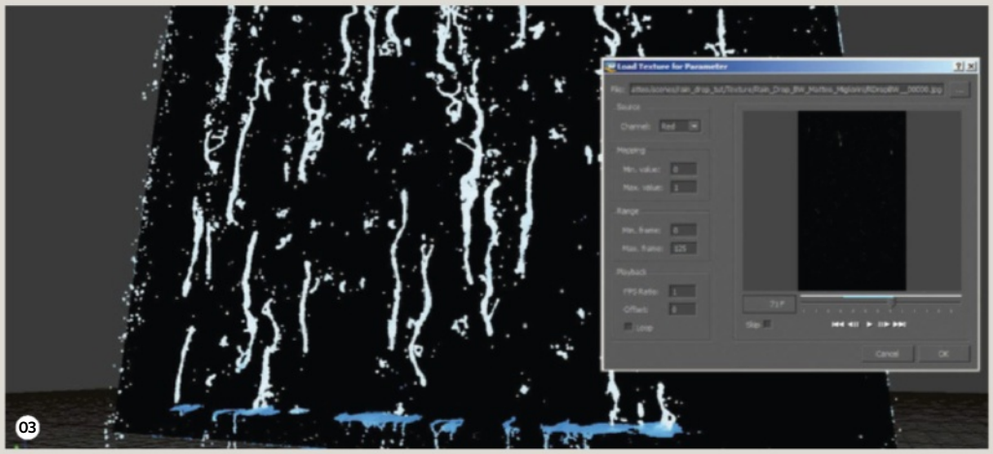
I prefer to use an exclusive link because it's better for managing simulations, so you should set it as follows. Before you start, make sure you've deleted all the various elements from the Global Link. Select and drag the object_emitter into the Exclusive Link tab and connect the Daemons: KV_SAFE_AREA, KV_WINDOW, K_Speed, Gravity and Window geometry. Also connect the Daemon Drag, which we'll discuss next. Don't insert the list glass_emitter at this stage, because it won't be interacting with the simulation and could act as an obstacle.

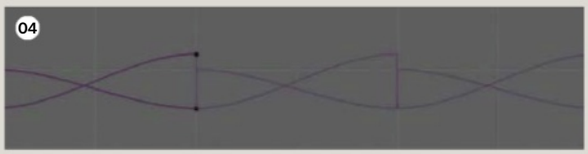
03 Prepare the emitter object for raindrops

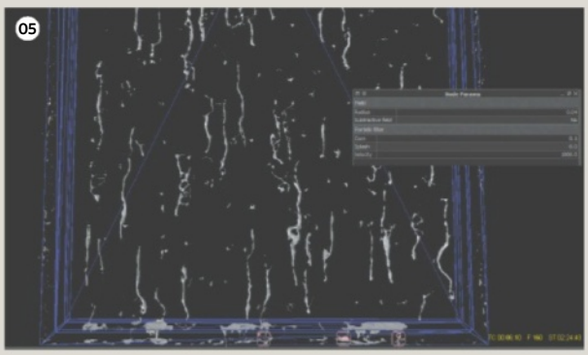
Now connect the object_emitter to the Geometry object called glass_emitter. To create a good effect you can load a drop sequence on the Channel Speed (Object Emitter>Object>Speed, then right-click on the maps icon and load the texture). You can find the exact same footage supplied with this issue ('Rain_Drop_BW_Matteo_Migliorini'). To limit the amount of particles being created, assign a value of 200,000 – or whatever is best for your scene – and create a Drag Daemon with a value of 0.25. You'll also need to work on other values such as Surface Tension (50) and Distance Threshold (0.001).

04 Add detailed movement

Before launching the simulation you should work on some of the values inherent to the object_emitter. The Surface Tension option enables you to control how fast the drops will be falling and you can also adjust their Interaction and Collision options, inputting a low value. Also, in order for the droplets to descend in a realistically random fashion, you need to create two Daemon Noise Fields with different values and set an animated loop on them. Add Noise_Field_Big with a Strength of from 0.25 to 0.6, and Noise_Field_Small with a Strength from 0.5 to 0.25. You'll now need to connect these to the object_emitter in an exclusive link.







Tips and tricks for RealFlow

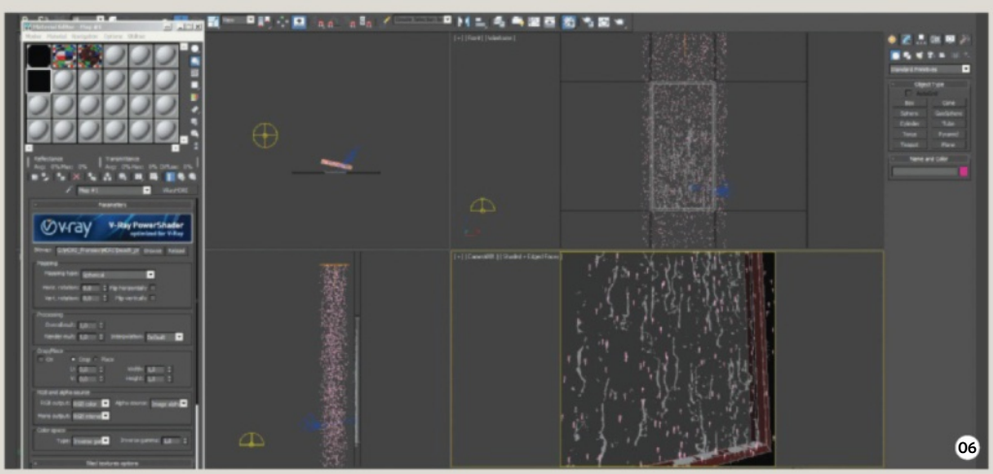
When importing geometry, you must make sure the Unit Scale is correct. If your object is very big, you can set the general scale of the geometry (in Scale Options) to 0.5 or 0.1, depending on your project and the kind of simulation you want. Here I'm using a Scale of 0.5, but you should increase the resolution of your Particle Emitter and check the Substeps in Simulation Options (here I set Resolution to 20 and the Min/Max Substeps to 25-350). If your simulation is more accurate, you can get more information to create a good mesh.

05 Create a mesh with Particle Mesh

Now you need to make a mesh with Particle Mesh (Renderkit) and set it with a Sphere and a good Polygon Size (in this case 0.04). Much more important is the Smooth (50) and the Filters (with Relaxation=0.08 and Steps=32). You'll have to insert all the emitters (setting the same Radius of the mesh and a Core=0.1). Create another object_emitter with the same settings of the first system, but you can also connect the Window geometry to make more realistic effects. When you finish with the mesh, import it into your rendering software.

06 Move to post-production

Try using a basic particle system (blizzard), with preset rain, and positioning it between the geometry (the window) and your visual point (the camera). In this way you can simulate an effect of falling rain. Just apply a classic water material on the rain element. The lighting is based only via HDRI because you want to simulate the effect of a rainy day without direct light, but only with indirect illumination. You can post-process the image by adding vignette, depth of field and motion blur effects or you can apply colour-correction for cooler tones.



3DArtist Subscriptions Voucher

☑ **YES! I would like to subscribe to 3D Artist**

Your Details

Title_____ First name_____

Surname_____

Address_____

_____

_____

Postcode_____ Country_____

Telephone number_____

Mobile number_____

Email address_____

Please complete your email address to receive news and special offers from us

Direct Debit Payment

☐ UK Direct Debit Payment: I will receive my first 3 issues for £1, I will then pay £21.60 every 6 issues thereafter. I can cancel at any time

Instruction to your Bank or Building Society to pay by Direct Debit

Please fill in the form and send it to: Dovetail, 800 Guillat Avenue, Kent Science Park, Sittingbourne, ME9 8GU

Name and full postal address of your Bank or Building Society

To: The Manager — Bank/Building Society

Address

Postcode

Name(s) of account holder(s)

Branch sort code

Bank/Building Society account number

Originator's Identification Number: 5 0 1 8 8 4

Reference Number

Instructions to your Bank or Building Society
Please pay Imagine Publishing Limited Direct Debits from the account detailed in this instruction subject to the safeguards assured by the Direct Debit guarantee. I understand that this instruction may remain with Imagine Publishing Limited and, if so, details will be passed on electronically to my Bank/Building Society

Signature(s)

Date

Banks and Building Societies may not accept Direct Debit instructions for some types of account

Payment details

Your EXCLUSIVE READER PRICE 1 year (13 issues)

☐ UK £62.40 **(save 20%)** ☐ Europe £70 ☐ World £80

Cheque

☐ I enclose a cheque for £_____

(made payable to Imagine Publishing Ltd)

Credit/Debit Card

☐ Visa ☐ MasterCard ☐ Amex ☐ Maestro

Card number _____ Expiry date _____

Security number ☐☐☐ (last three digits on the strip at the back of the card)

Issue number ☐☐ (if Maestro)

Signed _____

Date _____

Code: PCJ134Q

Please tick if you do not wish to receive any promotional material from Imagine Publishing Ltd by post ☐ by telephone ☐ via email ☐. Please tick if you do not wish to receive any promotional material from other companies by post ☐ by telephone ☐. Please tick if you DO wish to receive such information via email ☐.

Terms & Conditions apply. We publish 13 issues a year, your subscription will start from the next available issue unless otherwise indicated. Direct Debit guarantee details available on request. This offer expires 31 March 2014.

I would like my subscription to start from issue: ☐☐☐

Return this order form to:

3D Artist Subs Department, 800 Guillat Avenue, Kent Science Park, Sittingbourne ME9 8GU

or email it directly to **3dartist@servicehelpline.co.uk**

To manage your subscription account visit **www.imaginesubs.co.uk**

THREE EASY WAYS TO SUBSCRIBE

1. Online

Order via credit or debit card:

www.imaginesubs.co.uk/tda

and enter the code PCJ134Q

2. Telephone

Order by phone, quoting code PCJ134Q:

0844 249 0472

Overseas: +44 (0) 1795 592 951

3. Post or email

Please complete and post the form to:

3D Artist Subs Department
800 Guillat Avenue
Kent Science Park
Sittingbourne
ME9 8GU

Alternatively, scan and email the form to: **3dartist@servicehelpline.co.uk**

US readers turn to page 102

EXCLUSIVE SUBSCRIBER BENEFITS

Subscribe today & get your first three issues for £1!

- Massive savings on the cover price
- Pay only £3.60 for every future issue, saving 40% on the store price
- Free postage & packing in the UK
- Free disc every issue
- Delivered to your door

Subscribe and get 3 issues for £1

GO DIGITAL!

GREAT DIGITAL SUBSCRIPTION OFFERS AVAILABLE AT:

GREATDIGITALMAGS.COM

FOR ANDROID, MAC, PC iPHONE & iPAD

The UK's best 3D magazine has never been so affordable, thanks to this introductory offer

SUBSCRIBE TODAY www.imaginesubs.co.uk/tda

and enter the code PCJ134Q

Mobile workstations group test

REVIEWS BY
Orestis Bastounis, technology and software writer based in the UK

Improved portability and superior battery life are today's big trends in mobile computing, but while slim devices such as ultrabooks are perfect for Facebook or writing essays, they don't offer much in terms of raw computing performance.

To run 3D software, designers need a different class of laptop – namely mobile workstations that come with high-end mobile processors and powerful NVIDIA Quadro or AMD FirePro GPUs. They aren't thin or light and will need regular charging, but they mean your rendering environment can be carried wherever your work takes you.

Here we've examined four competitive mobile workstations to see the performance they offer and whether they truly provide a viable alternative to traditional desktops.

Dell Precision M4700

A well-designed and portable 15.6-inch workstation with a powerful processor, but it all comes at a cost

Dell charges an eye-watering £4,185 for this top-end configuration of its Precision M4700 workstation. While it unfortunately seems that you're paying extra for Dell's branding, the price is somewhat justified with some nifty hardware inside, such as a 3GHz Intel Core i7 3940MX processor, two SSDs and a Quadro K2000M for rendering.

You also get a machine with razor-sharp looks. Multi-toned matte greys and squared edges give the Precision M4700 a really sleek appearance, sending a strong message that this tech is intended for serious work. This is hardly surprising, given Dell's comfortable position as a firm corporate favourite. It's as much intended for deep-pocketed business users who work primarily with spreadsheets, with the occasional need for a powerful GPU, as it is for 3D designers.

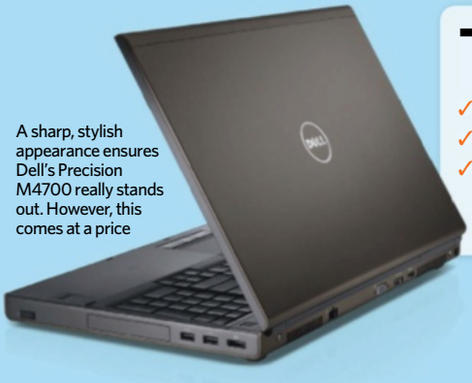
That's fine though, as the M4700 is great for 3D modelling, with plenty of brawn to match its subtle beauty. When Turbo mode kicks in during processor-intensive tasks, the Intel Core i7 3940MX processor goes up to 3.9GHz, resulting in quick rendering times in 3ds Max and a great score in Cinebench.

This high-end processor adds £500 to the price, but it's also worth noting the Precision uses miniscule mSATA SSDs, which cost approximately twice the amount that a regular SSD does.

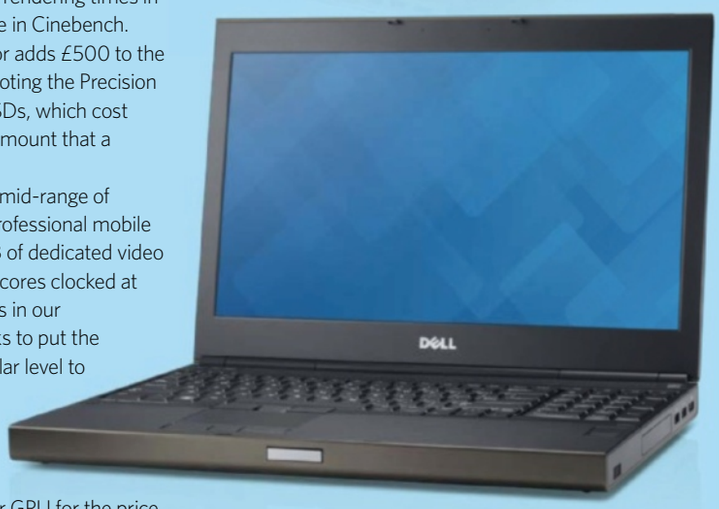
The K2000M is in the mid-range of NVIDIA's Kepler-based professional mobile graphics cards. It has 2GB of dedicated video memory and 384 shader cores clocked at 745MHz, achieving scores in our SpecViewPerf benchmarks to put the M4700 on a roughly similar level to desktop workstations with last generation's Quadro 2000 cards.

It's a shame that Dell hasn't squeezed in a faster GPU for the price, but that's understandable since the 55W power consumption is the limit of what can be used in a mobile computer of this size.

The 15.6-inch 1,920 x 1,080 IPS display screen provides good viewing angles and is clear and incredibly crisp, but at first glance its image quality isn't a giant leap ahead of more affordable mobile workstations. Also, given that the M4700's hardware is decent enough, but not amazing, we'd carefully consider other options before emptying our bank account for this particular workstation.



A sharp, stylish appearance ensures Dell's Precision M4700 really stands out. However, this comes at a price



The 15.6-inch Dell Precision M4700 is more portable than 17.3-inch laptops, but this limits the size of its graphics card space

Essential info

Price: £4,185 / $6,730 US*

www.dell.com/uk/business/p/precision-m4700/pd

OPERATING SYSTEMS
- Windows 7 Professional
- Windows 8 Pro (optional)

SYSTEM SPECIFICATIONS
- CPU: Core i7 3940XM (3GHz)
- Display: 15.6-inch IPS
- Video: NVIDIA Quadro K2000M
- Memory: 16GB DDR3
- Storage: 256GB Samsung PM830 SSD, 512GB Samsung PM830 SSD

The good & the bad

✓ Excellent graphics clarity
✓ Well-built and stylish design
✓ Good performance, especially from the CPU
✘ Too expensive
✘ Slightly small trackpad

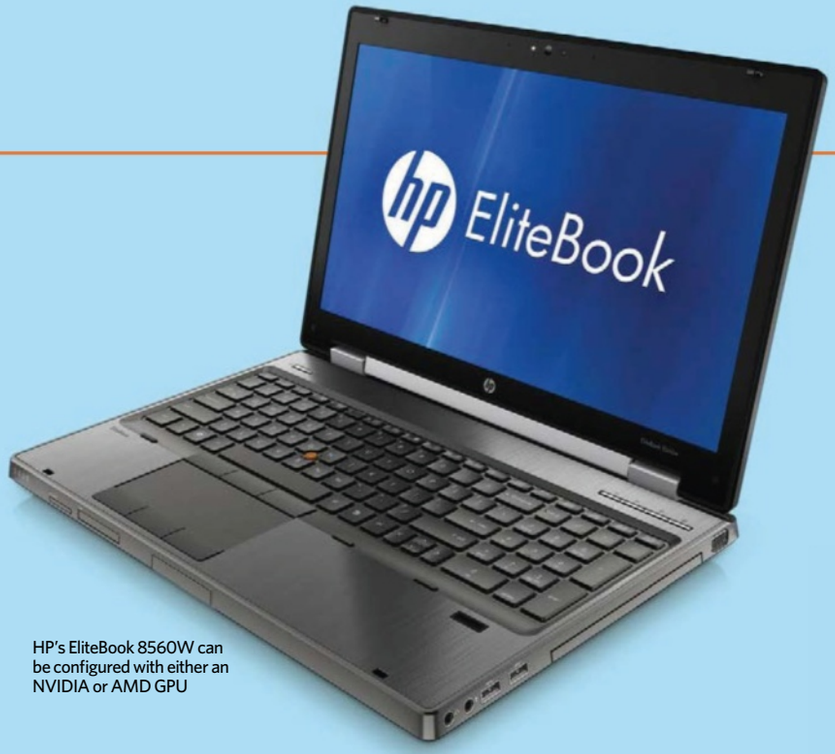
Our verdict

Features	7/10
Ease of use	8/10
Quality of build	9/10
Value for money	4/10

"Though Dell's M4700 has an undeniable premium feel, it simply lacks the 3D power to justify the price"

Final Score 7/10

*Price conversion correct at time of printing



HP's EliteBook 8560W can be configured with either an NVIDIA or AMD GPU

HP EliteBook 8560W

A 15.6-inch mobile rendering platform with 10-bit colour accuracy and an AMD GPU

Two aspects of the EliteBook 8570W help it stand out from other mobile workstations. The configuration sent to us was equipped with a FirePro M4000 GPU under the hood – AMD's rough equivalent of NVIDIA's Quadro K2000 (you can choose either when ordering). But more noticeably, it also came with a 15.6-inch, 10-bit DreamColor display – HP's monitor technology designed to provide exceptional colour accuracy that is intended for artists and graphic designers.

It's immediately clear what a difference this display makes. The warmth of colours, depth of blacks and overall brilliance of on-screen images makes it difficult to look at other displays afterwards. The included calibration software enables you to adjust the display to perfectly match other monitors in your office, or choose from a range of factory-calibrated presets.

As with the design of Dell's M4700, the EliteBook has a subtle appearance befitting one of the world's largest OEMs, with a similarly subtle grey tone.

It comes with a 2.7GHz Intel Core i7 3740QM, a hyper-threaded, quad-core chip based on the Ivy Bridge family, with a maximum turbo frequency of 3.7GHz. While it doesn't quite match the performance level of Intel's 3940XM mobile processor, it performed well in tests, with quick 3ds Max renders and a good Cinebench score.

However, we encountered a frustrating problem with the FirePro card, which ran at a reduced clock speed caused by a power management setting that severely hampered its performance. After contacting AMD, we fixed this problem by forcing the card to run at its native frequency, bypassing any settings in Windows.

Once this was done, the benchmark scores were more than adequate. AMD GPUs usually pull away from NVIDIA's in Maya and this was no exception, beating every mobile NVIDIA card in that test. If you primarily use Maya in your workflow, AMD is clearly the better choice. With other 3D software it's more than adequate too, though we noted that in most tests the K2000 edged slightly ahead.

The EliteBook's 10-bit DreamColor display provides exceptional accuracy, ideal for graphic artists

Essential info

Price: £3,176* / $5,107 US**

www.hp.com

OPERATING SYSTEMS

- Windows 7 Professional
- Windows 8 Pro (optional)

SYSTEM SPECIFICATIONS

- Video: NVIDIA AMD FirePro M4000
- Display: 15.3-inch 10-bit DreamColor
- Memory: 16GB DDR3
- Storage: 256GB SSD

Though at first we encountered some problems with the FirePro card, the benchmark scores were soon living up to the standards we've come to expect from AMD

The good & the bad

- ✓ **Bright, accurate and high-quality 10-bit DreamColor display**
- ✓ **Very competitive CPU and GPU performance**
- ✓ **A well-built, brilliantly designed chassis**
- ✗ **Doesn't offer the same overall performance of larger 17-inch models**

Our verdict

Features	**9**/10
Ease of use	**8**/10
Quality of build	**9**/10
Value for money	**7**/10

"While it adds to the cost, the accurate display is a great addition for any graphics pro"

Final Score 8/10

*Price calculated by adding £2,300 + £876 for the display **Price conversion correct at time of printing

The Quadro K5000M GPU inside the MGW-20 is more powerful than some desktop graphics cards

Scan 3XS MGW-20

Powerful graphical performance that's let down by a middling CPU

Scan was one of the few vendors able to send us a workstation containing NVIDIA's most powerful mobile GPU – the Quadro K5000M. As expected, the MGW-20 came with a 1,920 x 1,080 17.3-inch screen, as a larger chassis is needed to keep up with the graphics card's 100W power consumption.

The card crams a similar amount of hardware you'd find in a desktop GPU into a mobile package. 1,344 shaders and 4GB of GDDR5 video memory deliver 67.3 GTexels/sec of texture-fill rate.

The SpecViewPerf scores confirm this, completely eclipsing every other mobile computer we've seen, snapping at the heels of the scores attained by powerful desktop workstations and only really being beaten by systems with high-end Xeon processors.

Unfortunately, this incredible GPU is let down by a comparatively puny processor. When choosing a configuration, Scan went for a relatively mid-range 2.4GHz Core i7 3640QM processor, clearly to make it slightly more affordable. However, this had a negative effect in other benchmarks.

Our 3ds Max Underwater render took roughly 15 per cent longer to complete than the offerings of HP and Workstation Specialists, and while you can easily improve the performance by upgrading the processor to a 3940MX, this adds £588 to the price.

Scan at least deserves bonus points for being one of the few manufacturers to realise that a large trackpad is desirable on a laptop, however, those points are immediately docked due to the horrible material the trackpad is made from. Our fingers couldn't effortlessly glide over it and often stuck to the surface, so using a single gesture to move the cursor from one side of the screen to the other became tricky at best.

As usual, a small British system integrator such as Scan can't quite match the build quality and stylish design offered by the world's biggest OEMs. With its gloss and slight overuse of angled edges, the MGW-20 looks like a poor man's Batmobile. However, at least there's no skimping on expansion – all four USB ports are USB 3 and there's an eSata, an HDMI and a DisplayPort.

As with all workstations, you can customise the specification, software and storage of the MGW-20, so for starters we'd highly recommend investing in a more powerful processor. Also, plug in a separate mouse so the trackpad is no longer an issue. Once you've done that, you'll have yourself a very capable replacement for your desktop.

Essential info

Price: £2,780 / $4,469 US*

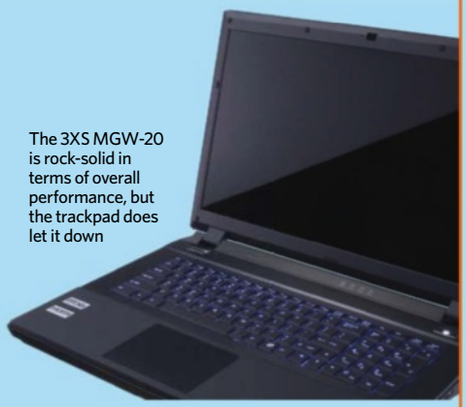
http://3xs.scan.co.uk

OPERATING SYSTEMS

- Windows 7 Professional
- Windows 8 Pro

SYSTEM SPECIFICATIONS

- Video: NVIDIA Quadro K5000
- Display: 17.3-inch LCD
- Memory: 16GB DDR3
- Storage: 256GB SSD, 1TB Hitachi Travelstar 7K10000 HDD



The 3XS MGW-20 is rock-solid in terms of overall performance, but the trackpad does let it down

The good & the bad

- ✓ The fastest mobile GPU available so far
- ✓ Plenty of storage
- ✓ Comparatively affordable
- ✓ Four USB 3 ports
- ✗ Poor trackpad material
- ✗ Low- to mid-range CPU

Our verdict

Features	8/10
Ease of use	8/10
Quality of build	5/10
Value for money	8/10

"Despite our complaints about the build, this is a powerful computer with everything in the right place"

Final Score 7/10

*Price conversion correct at time of printing

Workstation Specialists WS-M1760

A custom-built mobile workstation from a vendor specialising in 3D systems

Although consumer laptops have settled on display sizes no larger than 15 inches, a larger working area is an obvious benefit for any busy artist. Making fiddly image alterations, tweaks to 3D models or just viewing documents side-by-side is simply easier when there's more space to see what you're doing.

Hence, like Scan's 3XS MGW-20, the use of a 17.3-inch display in Workstation Specialists' WS-M1760. It's more than large enough to provide an alternative work environment to a desktop workstation.

The downside to this sizeable display is an enormous chassis to match, which stretches the limits of the term 'portable'. As with any mobile workstation, the WS-M1760 is unashamedly thick and bulky; its monstrous frame simply laughs at any svelte MacBook Air that might be used by someone opposite on the train.

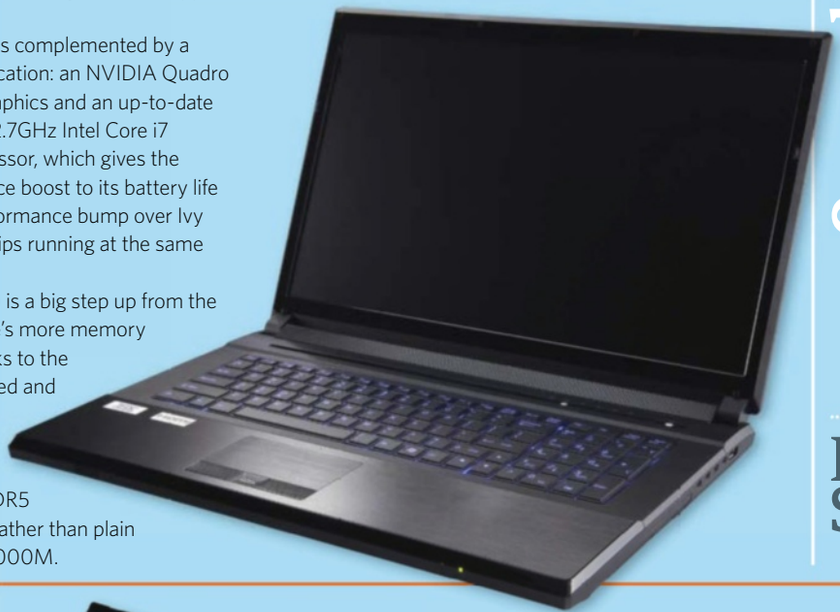
The machine is complemented by a high-end specification: an NVIDIA Quadro K3000M for graphics and an up-to-date Haswell-based 2.7GHz Intel Core i7 4800MQ processor, which gives the WS-M1760 a nice boost to its battery life and a small performance bump over Ivy Bridge-based chips running at the same clock frequency.

The K3000M is a big step up from the K2000M. There's more memory bandwidth thanks to the higher clock speed and the widening of the bus width to 256-bit. There's also 2GB of GDDR5 video memory, rather than plain DDR3 in the K2000M.

This results in some impressive performance. Cinebench and 3ds Max rendering times were excellent, while in SpecViewPerf the WS-M1760 raced ahead of certain desktop workstations we reviewed less than 12 months ago – an impressive feat given those systems aren't confined to a mobile chassis.

While this workstation is definitely not a contender for a laptop beauty contest, appearance isn't everything, and the screen and trackpad remain perfectly functional. However, it must be noted that the WS-M1760's loud fans are more of an issue, drowning out the noise of eight other computers being tested when under load.

A K3000M coupled with a powerful Core i7 processor ensures excellent 3D performance from the WS-M1760



Essential info

Price: £2,558 / $4,112 US*

www.workstationspecialists.com

OPERATING SYSTEMS

- Windows 7 Professional
- Windows 8 Pro (optional)

SYSTEM SPECIFICATIONS

- CPU: Intel Core i7 4800MQ processor 2.7GHz
- Display: 17.3-inch LED display
- Video: NVIDIA Quadro K3000M
- Memory: 16GB DDR3
- Storage: 240GB Intel 525 mSATA SSD, 750GB 7200RPM HDD

Although the WS-M1760 lacks the unique design of Dell or HP's offerings, it offers great performance

The good & the bad

- ✓ Great all-round CPU and GPU performance
- ✓ Reasonable value for money
- ✘ Noisy fans
- ✘ Fairly plain chassis

Our verdict

Features	9/10
Ease of use	8/10
Quality of build	8/10
Value for money	9/10

"Above-average performance, fair pricing and solid construction make the WS-M1760 a strong contender"

Final Score 9/10

Though it may be bigger, louder and uglier than its rivals, the sheer power and artist-friendly features of the WS-M1760 set a standard for other mobile workstations

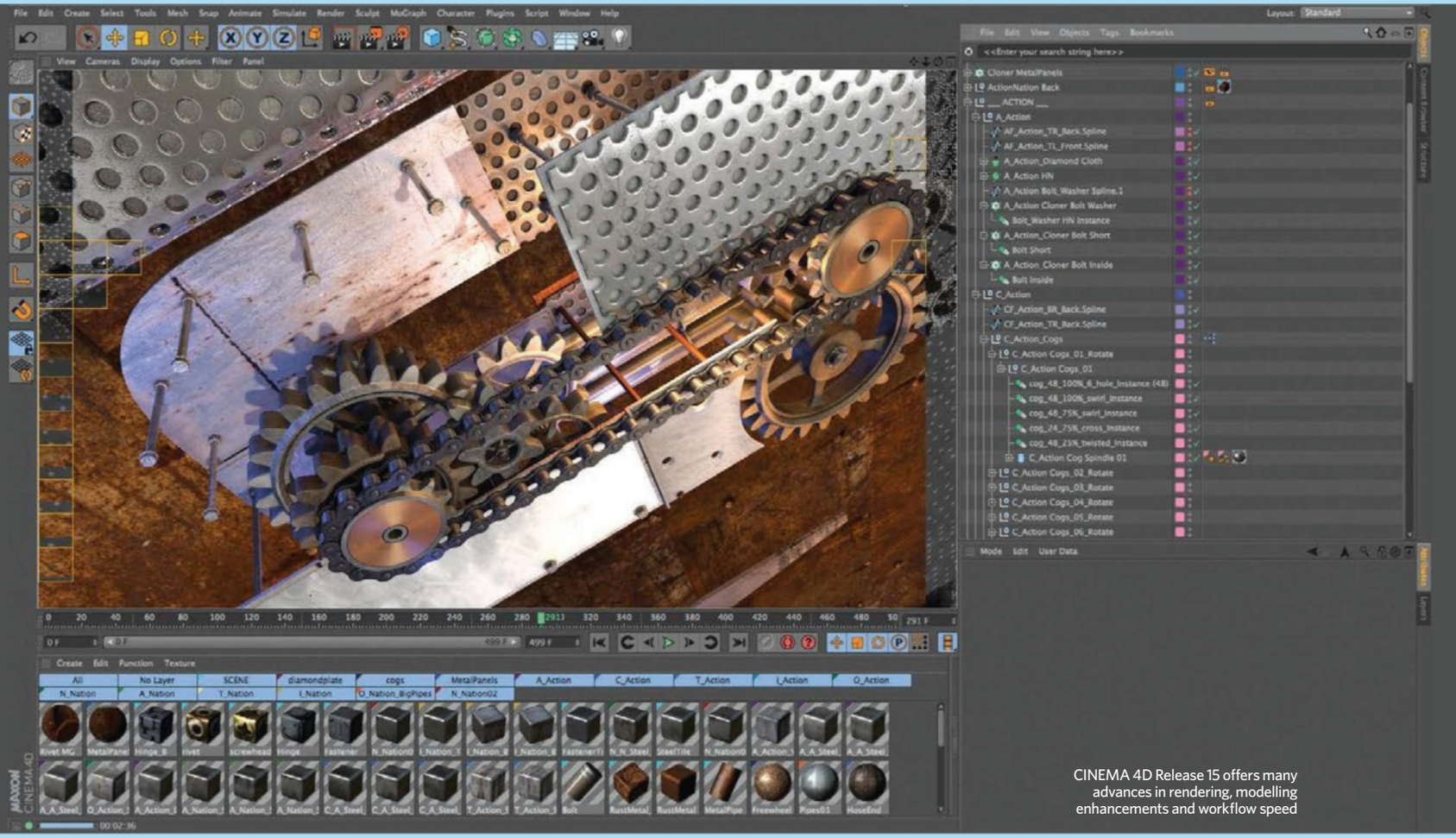
Our top pick

There's a clear choice between portability and performance with mobile workstations. While the 15-inch models are better suited for rendering on the move, the bulky 17-inch ones deliver the rendering performance to entirely replace desktops. On your desk, with a secondary monitor and a separate mouse attached, you'll forget you're working on a laptop at all.

HP's EliteBook 8560W really took our fancy with its phenomenal display and solid performance, coupled with a stylish design. However, Workstation Specialists WS-M1760 is our first choice. Its build quality can't quite match the likes of Dell's but we have few other reservations about it, bar the noisy fans, which we can live with.

More importantly, it achieved great results in our tests, which is what counts most if pushing polygons is how you make a living.

*Price conversion correct at time of printing



CINEMA 4D Release 15 offers many advances in rendering, modelling enhancements and workflow speed

CINEMA 4D Release 15

Tim Clapham guides us through the essential new features of CINEMA 4D Release 15

REVIEW BY Tim Clapham, director of Luxx, Australia

Another year flies by and another release of CINEMA 4D is upon us. The features that have been developed are as robust and stable as we have come to expect. CINEMA 4D is renowned for its ease of use and stability, and this release is no exception.

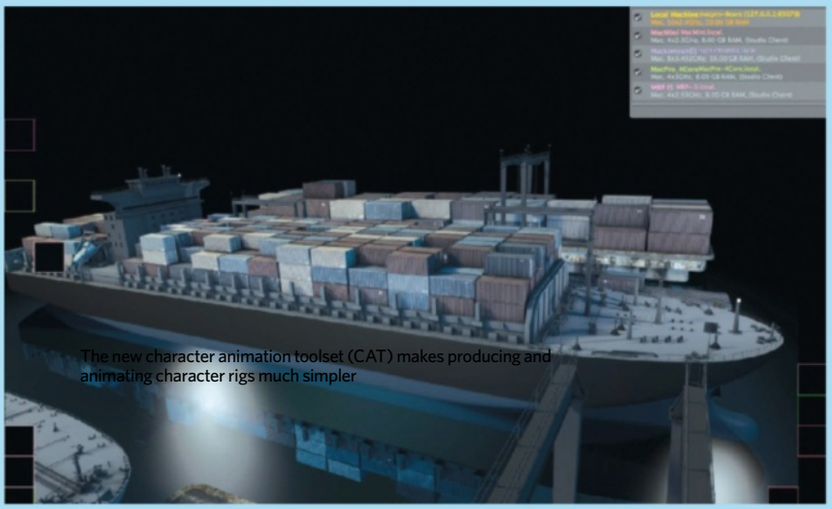
If you love rendering as much as I do, R15 is a treat! The physical renderer has the option to use Intel Embree technology. You won't notice any difference in the quality of renders, but you should see a speed boost, especially when working on complex scenes.

In the past, to render animation with Global Illumination I would have used QMC. Although reliable, QMC alone resulted in slow and noisy renders. With R15, Maxon has significantly improved GI and irradiance cache has been totally overhauled, meaning it is now more robust and faster to boot. As well as improving irradiance cache for GI, Maxon has included the same technology for Ambient Occlusion, which can now use a saved cache with interpolated samples. Simply put, it's faster.

My favourite GI recipe is the combination of QMC (primary) with Light Mapping (secondary). Light mapping renders beautifully, offering depths of incredibly high values that were previously impossible. With QMC for the first bounce you're guaranteed a rock solid result. Light mapping combined with radiosity maps for subsequent bounces means a fast and stable render with rich colour bleeding. The biggest drawback is that the caches can require a lot of disk space if you're rendering animations.

Team Render is Maxon's newly integrated network-rendering solution, replacing the old NET Render. Incredibly easy to use and requiring very little setup, Team Render works with the existing render queue allowing you to add jobs and reorder them directly in Cinema 4D. It also has the added functionality of enabling users to network render straight to the picture viewer. When working with animation you can check frames as they are created from within the application. For those of you working with still images, Team Render offers bucket rendering, directly to the picture viewer if required. You can distribute single frame rendering over your network, offering a huge increase in productivity for those who render print resolution regularly. However, while NET was certainly due an update, the lack of an improved server solution might be a sore point with studios currently using NET. Hopefully in a future development Maxon will consider adding features such as a web interface, users, groups and priorities so TR becomes a fully featured studio-rendering solution. I'm pretty confident this won't be the last we see of Team Render.

GI improvements offer stability and speed. Here I'm rendering with a diffuse depth of 32 thanks to light mapping



The new character animation toolset (CAT) makes producing and animating character rigs much simpler

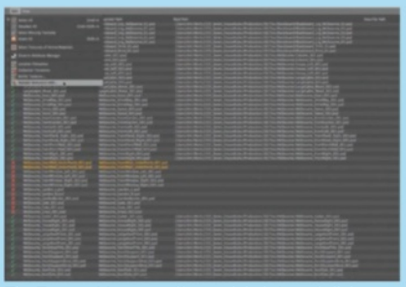
Team Render allows you to network render stills directly within the picture viewer

Modelling has seen a few improvements too. The new bevel tool simply rocks! With an abundance of parameters I'm confident it's the most feature-rich bevel tool available, plus everything remains live and interactive so you can see the results of the bevel before you commit. There's also an improved slide tool that works with multiple edges, loops and for duplicating existing edges. I've previously used a plugin to achieve this, so it's good to see this integrated into the application.

Sculpting has also received some noteworthy attention. You can now sculpt directly onto polygon objects, even onto pose morph targets. Masking and sculpting geometric shapes has also been enhanced with the addition of line, lasso, rectangle and polygon tools.

Workflow has been considered with new kerning tools to reduce the need for designers to visit other applications, and the Texture Manager offers global control for your textures with find and replace and filtering options; both welcome additions.

R15 is a great release; it's good to see Maxon spending development time improving and enhancing existing technologies and workflows. The rendering improvements alone make it worth the upgrade; everything else is a bonus!



The Texture Manager offers a global view of all the textures in your scene and many ways to control them

Essential info

Price: £2,600 / $3,695 US*

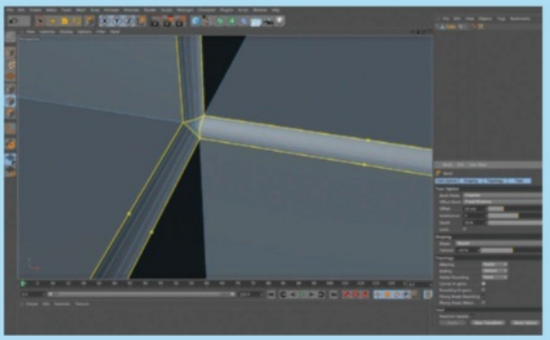
www.maxon.net

OPERATING SYSTEMS

- Mac OS
- Windows

OPTIMAL SYSTEM REQUIREMENTS

- Windows XP, Vista or 7 running on Intel or AMD CPU with SSE2-Support
- Mac OS X 10.6.8 or higher running on a 64-bit Intel-based Mac
- 1024 MB free RAM



The new Bevel tool comes with an abundance of parameters to facilitate the creation of perfect topology

The good & the bad

- ✓ Greatly improved rendering with GI & AO
- ✓ Network rendering with Team Render
- ✓ Sculpting improvements
- ✓ Fantastic new bevel tool
- ✓ Kerning for text objects
- ✘ No server-based solution for network rendering
- ✘ Lack of UV and painting improvements
- ✘ Materials system needs overhaul

Our verdict

Features	7/10
Ease of use	8/10
Quality of results	8/10
Value for money	7/10

"A solid and stable release with many rendering, modelling and workflow improvements"

Final Score 8/10

*Price conversion correct at time of printing

If Apple made a magazine

www.icreatemagazine.com

FREE DISC: CUSTOMISE YOUR OS X ICONS
64-BIT LOGIC PRO X PLUG-IN
FREE APERTURE EFFECTS
For Mac, iPad and iPhone users
iCreate
The Best iOS 7 APPS
The apps you need for the new OS
20 Amazing Pages projects
Give your Mac an iOS 7 makeover
Logic Pro X starter guide
Foolproof Mac backup
iMovie sci-fi effects
Enhance your iPhone photos
27 PAGES OF OS X GUIDES
PROJECTS FOR iOS & MAC OS X
PRO iPHONE CAMERA APPS
FAMILY PHOTO DIARY
CUSTOMISE YOUR MAC
Jailbreak solutions
Best apps for iOS 7
36 PAGES OF OS X GUIDES
Master Vector Drawing
SHOOT AN EPIC ACTION MOVIE
SPECIAL FX TIPS
iOS 7 REVEALED
PIXELMATOR APP

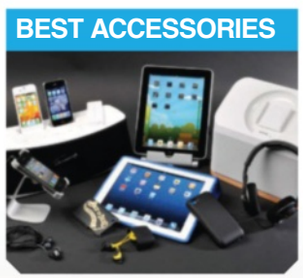
FREE DISC EVERY ISSUE

iCreate

Available from all good newsagents and supermarkets

ON SALE NOW

The best iOS 7 apps • iOS 7 Mac makeover guide • 20 Pages projects



BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print Tablet Phone Desktop

facebook.com/icreatemagazine twitter.com/icreatemagazine

KeyShot ZBrush GoZ Plugin

Concept artist Furio Tedeschi takes us through the features of the new ZBrush/KeyShot integration

REVIEW BY **Furio Tedeschi,** concept artist, South Africa

If you're looking for a fast solution to achieve studio-quality renders, scientifically accurate materials and real-world lighting in your ZBrush models and sculpts, then you don't need to look much further than KeyShot. Now supporting Pixologics's GoZ plugin, the new KeyShot functionality has increased the benchmark for ZBrush users.

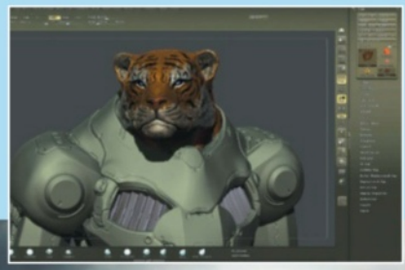
Previously, users would have to export an OBJ file and load it into KeyShot. Now, however, the KeyShot GoZ Plugin allows users to easily and cleanly transfer their current SubTools directly into KeyShot. You are even able to skip adding UVs in ZBrush first, as KeyShot will run an automatic UV unwrap on import to help you speed up the process and workflow. The update will also retain the existing polypaint/textures, HDRI, lighting and existing setup inside KeyShot, and if your ZBrush file contains key frames it will also include the animation timeline. KeyShot GoZ will also conveniently maintain all SubTool naming conventions for managing your model in KeyShot more efficiently. Basically, whatever you have in ZBrush will automatically exist in Keyshot. This is handy, to say the very least.

KeyShot has a very simple interface, utilising drag-and-drop functionality for all material and HDRI environments, making it easy to quickly create variations on elements such as lighting. As KeyShot is a realtime renderer you don't need to hit the render button and wait for the results. As soon as you assign a material to a part, you will see the change immediately, creating a more immersive experience and allowing you to focus more on the artistic aspect of your 3D model. The result is better finished sculpts in a much faster timeframe.

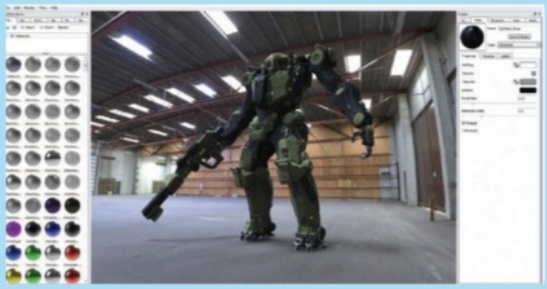
Since KeyShot is CPU based and all data is stored in RAM, it allows you to work quickly with extremely large data sets containing tens of millions of polygons. Also, as it's highly optimised, this means you are able to even use a laptop and still get a very fast and responsive experience. It helps that KeyShot is as simple to use as ever, with a gradual learning curve, an elegant layout and an overall more streamlined experience.

As a concept artist I find the KeyShot GoZ plugin to be an invaluable tool, as it allows for fast generation of variations and options; a key factor in my work. It will speed up your ZBrush to KeyShot workflow no end, allowing you to focus on creativity rather than the technical side of the process.

Thanks to the new plugin, those who use a ZBrush/KeyShot pipeline will find their work efficiency boosted by a significant amount



The plugin enables users to tweak and change models or SubTools in ZBrush, and then simply update the current scene in KeyShot using the GoZ All button



Thanks to the GoZ plugin, any changes made within ZBrush will automatically update inside KeyShot

Essential info

Price: Free (ZBrush and KeyShot required)

www.keyshot.com

OPERATING SYSTEMS

- Windows 7 & 8 32/64 bit
- Mac OS X 10.6 or later

OPTIMAL SYSTEM REQUIREMENTS

- 1 GB RAM
- Any graphics card
- OpenGL 2.x or higher
- AMD or Pentium 4 processor or better
- Minimum 500MB hard disk space

The good & the bad

- ✓ Fast and easy to use
- ✓ Professional results
- ✓ Easy to learn
- ✓ Do not need a high-end PC to use
- ✗ Lacking displacement maps and render pass features

Our verdict

Features	8/10
Ease of use	10/10
Quality of results	9/10
Value for money	10/10

"An essential upgrade to ZBrush and KeyShot for those who want to dramatically boost workflow speed"

Final Score 9/10

*Price conversion correct at time of printing

Subscribe today & get 5 free issues*

Special offer for US readers

RenPeng Dong

Personal portfolio site
www.oldrhyme.cgsociety.org
Country China
Software used
3ds Max, Maya, ZBrush, Mudbox, Photoshop, V-Ray

"I saw an image on a website that was like a kind of transparent man blending with his background, which brought me this great idea... [I] decided to show the feeling of part drying paint, part real, part plaster"

Non-US readers turn to page 92

Don't risk missing an issue

Subscribe today and save $$$

- Subscribe and pay just $126 for 13 issues
- Receive the mag before it appears in the shops
- Get each issue for as little as $9.69 (usually $14.99)
- Never miss an issue

3DArtist

To order by telephone, call
+44 (0) 1795 592951
and quote the code USA2

To order online, visit
www.imaginesubs.co.uk/tda
and enter the code USA2

This is a US subscription offer. You will actually be charged £80 sterling for an annual subscription. Your subscription will start from the next available issue. This offer expires 31 March 2014. *5 free issues refers to the USA newsstand price of $14.99 for 13 issues which comes to $194.87, compared with $126 for a subscription.

INDUSTRY ● EDUCATION ● RECRUITMENT ● CAREERS

workspace 3D

Inside guide to industry news, studios, expert opinion and education

104 News

Industry news

Autodesk's new 3D tool for budget-conscious game developers means more creatives can access Maya's capabilities

106 Project focus

MPC

We go behind the scenes of MPC's epic game trailer for the latest *Assassin's Creed* experience

108 Industry insider

Ben Mauro

Discover what it's like to work on *The Hobbit* trilogy and *Elysium* from this senior art director

111 Course focus

Lost Boys Studios - School of Visual Effects

Learn FX from a Houdini expert at a school with a current 98 per cent placement rate

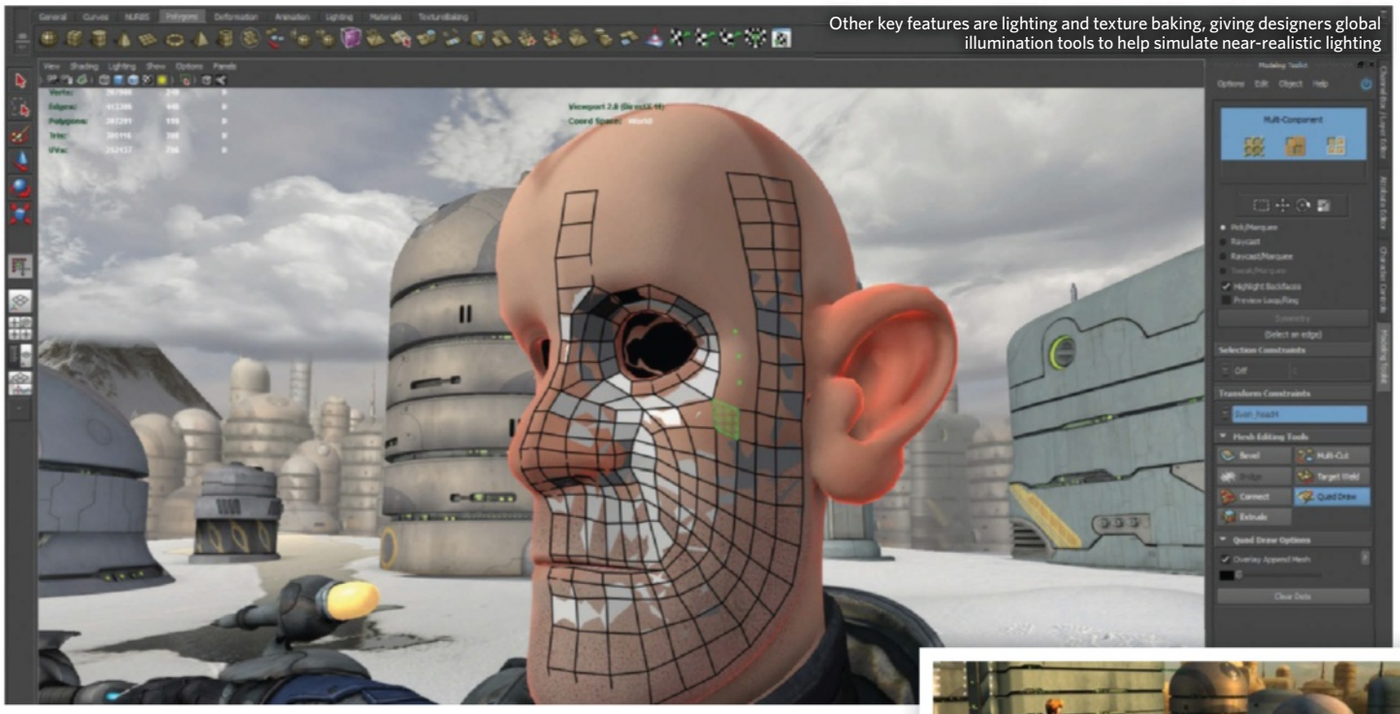
inside

> "We see indie game developers as a key part of the industry, driving innovative new production techniques and gameplay"

Chris Bradshaw, senior vice president, Autodesk Media & Entertainment. Page 104

Hyperspace Madness
A game created by Autodesk

To advertise in **workspace** please contact
Ryan Ward on **01202 586415** or **ryan.ward@imagine-publishing.co.uk**



Other key features are lighting and texture baking, giving designers global illumination tools to help simulate near-realistic lighting

Autodesk launches Maya LT software

Autodesk unveils its new 3D modelling and animation tool for budget-conscious videogame developers

For more information and to download a free trial of Maya LT, visit: **www.autode.sk/165OsfD**

Created to provide an affordable new toolset for the creation of professional-grade 3D mobile, PC and web-based game assets, Maya LT provides out-of-the-box compatibility and support for industry-standard game engines such as Unity 3D and Unreal Engine. It also offers the ability to use the FBX file format for primary data exchange, all for up to $3,000 (£1,900) less than Maya.

The new software includes fundamentally the same modelling and texturing toolsets and standard animation features as in the Maya 2014 release. These can be used to create and alter 3D assets, such as a skeleton generator and inverse kinematics with Autodesk HumanIK. Maya's high-quality Viewport 2.0 preview is also available to help developers view assets as they would appear in game, reducing iteration and asset creation time.

However, although Maya LT can generate playblasts, rendering is more restricted as it does not include mental ray, which was deemed during research not to be required for indie or game developers, who typically use the game engine to see details and already have access to the high-fidelity DirectX 11 viewport featured in Maya LT. The new tool is also unable use plug-ins; will only be able to export a maximum of up to 25,000 polygons per object; and does not come with any support for scripting. Maya LT also lacks any of Maya 2014's dynamics and effects features, which aren't completely necessary in a toolset aimed at asset creation in indie game developer's workflows.

New features introduced with Maya LT will be ShaderFX, a shader editing tool that allows artists with no previous programming experience to build complex HLSL or CG FX shaders, and a new subset of geometry deformers. However, perhaps the best news of all is the price of the new software, with Maya LT available for a mere $795 (£500) for a standalone perpetual license. Autodesk has also recently announced plans to implement a new business model, including options to rent out its core software rather than buying it outright. With Maya LT the company is making its first foray into this interesting new model. Maya LT term licenses will be available as part of a monthly, quarterly or annual rental plan in the near future, starting at $50 (£30), $125 (£80) and $400 (£250) respectively.

Maya LT is an exciting prospect, offering game developers cheaper access to a professional-level tool that will be regularly updated in tandem with Maya. Maya LT is available now. You can learn more at **http://area.autodesk.com/mayalt**

Import & Export Formats

Maya LT has the ability to import certain 3D asset formats [Maya (.ma, .mb), Maya LT (.mlt), OBJ, FBX, AI, EPS] and texture formats (BMP, PNG, DDS, EXR, TGA, TIFF), although it will not be able to save files in Maya's .ma and .mb file formats, using its own .mlt file format and FBX instead.

● **HAVE YOU HEARD?** • A Stratasys 3D Printer in Japan is being used to customise equipment for Olympic athletes

Blender License Change

Cycles has been released with a more permissive Apache License, compatible with any program

Blender's ray-tracing engine Cycles has now had its source code license changed from GNU GPL to Apache License version 2.0: a permissive license which allows the renderer to be linked and used with any program, including commercial and in-house software at studios.

Though the Blender Foundation and Blender Institute will stay committed to developing Cycles as a render engine for Blender, the developers hope this new move will attract more contributors and make it easier to use for studios. The team also hope that this will make Cycles grow as a project in the long term.

"As Cycles is reasonably standalone and integrates many of these libraries already, it's a good candidate to share similarly with everyone," says Blender's Brecht van Lommel. "We welcome other developers to integrate it in other applications, and especially to get involved with the Cycles development team at blender.org."

Blender itself will be developed as a GNU GPL project, as this gives it the best protection to ensure the program remains available in a free and open domain

Stratasys and MakerBot

Merger between printing leaders completed

A pioneer with more than 25 years of 3D printing for prototyping and production experience, Stratasys has now completed its merger with MakerBot, enabling the company to offer the world's most popular desktop 3D printer through its new subsidiary. Founded in 2009, MakerBot has sold more than 22,000 printers and significantly developed the desktop 3D printing market.

"Stratasys and MakerBot share a vision about the potential for 3D printing to transform design and manufacturing," said David Reis, Stratasys' CEO. "Our goal now is to maximise the benefits this merger creates for our shareholders, our customers and our employees."

Stratasys
FOR A 3D WORLD™

Consistent with the terms of the merger, Stratasys will issue up to 4.7 million shares in exchange for 100 per cent of MakerBot's outstanding capital stock

Fuel3D tops Kickstarter goal

The affordable point-and-shoot 3D scanner campaign quadruples Kickstarter goal

Thanks to Kickstarter feedback, Fuel3D will work with Uformia, who will aim to develop automated stitching of multiple scans to create 360-degree models

Since launching as a campaign on Kickstarter this July, Fuel3D Inc's project to develop an affordable handheld 3D scanner has raised more than $300,000 (£190,000) after having already achieved its initial campaign goal in less than two days.

The new Fuel3D scanner will be capable of delivering high resolution 3D shape data and colour capture for a range of 3D modelling applications within seconds, and will be expected at a final market price of only $1,500 (£950).

Software shorts

Bringing you the lowdown on product updates and launches

Crytek's new CryENGINE

Crytek has released the CryENGINE, a PlayStation 4, PlayStation 3, Xbox One, Xbox 360, Wii U and PC development solution with scaleable computation and graphics technologies. Advanced physical-based shading with a skin and eye shader, a flexible time of day system and procedural GPGPU weather effects are among the latest additions. Learn more at www.bit.ly/e9QH7T

Exposure Control for V-Ray

Motiva

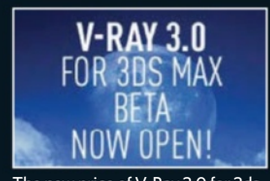
Motiva has released Exposure Control, a free V-Ray plug-in that improves the renderer's native exposure controls with support for real life camera films and silver retention value. Exposure Control is compatible with 32-bit and 64-bit editions of 3ds Max 2012 and above in conjunction with V-Ray 2.40.04 and above. Discover all the features at www.bit.ly/13AyKwS

Shotgun for game developers

Shotgun Software's production management tool is now optimised for integration into game-specific work flows. The launch is the result of a collaboration with more than 30 top game studios, including Avalanche, Microsoft Game Studios and EA, and allows studios to seamlessly manage their art department and remote partners' workflows. You can find out more and apply for a free trial at www.bit.ly/19YYohJ

V-Ray 3.0 for 3ds Max

Chaos Group has announced the V-Ray 3.0 for 3ds Max Beta program



The new price of V-Ray 3.0 for 3ds Max User license + 1 V-Ray 3.0 Render Node is $1,050/€750 /£665. The Single V-Ray Render Nodes 3.0 costs $350/€250/£220

Available now for users who already own a V-Ray for 3ds Max License, the new Beta release will allow testers direct access to the Chaos Group team via a forum, where they can offer constructive feedback and help make major improvements to the toolkit. Current enhancements to speed include ray tracing calculations running up to five times faster and hair rendering speeds at up to 15 times the previous rate. The new release will also feature a simplified user interface design, Progressive Production Rendering and a cross-application shader format.

DID YOU KNOW? ILM's Roger Guyett will show his work on *Star Trek Into Darkness* at this year's VIEW Conference in Italy

Project Focus

Black Flag trailer

VFX Supervisor Fabian Frank discusses the VFX behind the monumental live-action ship set for the Assassin's Creed: Black Flag trailer

MPC

Project *Assassins Creed IV: Black Flag* trailer

Description Ships burn and men are slain in this film for the launch of *Assassin's Creed IV: Black Flag*

Country UK

Bio MPC has been one of the global leaders in VFX for over 25 years, with facilities in London, Vancouver, Montreal, Los Angeles, New York and Bangalore. Some of the studio's most famous projects include the *Harry Potter* franchise, *Prometheus* and *Life Of Pi*, and advertising campaigns for brands such as Samsung, Cadbury, Coca Cola and John Lewis

Website www.moving-picture.com

Contributors

Chris Allen
VFX Producer

Stephanie Karim
Line Producer

Franck Lambertz & Fabian Frank
VFX Supervisors

Mark Gethin
Grade

Agency Sid Lee Paris
Production Company Stink
(**Director** Adam Berg)

Though the gaming industry has always been able to produce iconic characters, today's are so well known and universal that big-budget, live-action trailers on par with Hollywood are becoming the standard platform from which to present their stories. One such iconic character is the hooded assassin from the *Assassin's Creed* series, this time emerging in the form of ruthless pirate turned deadly killer Edward Kenway in the upcoming videogame *Assassin's Creed IV: Black Flag*.

MPC was the studio put in charge of seamlessly blending live action and CGI to create the game's moody and action-packed trailer. Featuring one of the most recognisable hero archetypes from one of the most successful videogames franchises available today, it goes without saying that the project had to be nothing short of spectacular.

"Our main role on set is to be as discreet as possible while remaining fully attentive of what is being shot," begins VFX supervisor for the trailer and lead of MPC's 3D team Fabian Frank. "We worked very closely with director Adam Berg during all stages of the VFX process, right from the pre-production stage to the final delivery of the trailer."

The incredible set featured everything from a pool containing 3,000 cubic metres of water to various sections of a full-size authentic Spanish ship, which took 60 construction workers three weeks to build.

As the shoot progressed, an added element of challenge was added for MPC when it was decided that the camera movement would travel upwards, revealing each deck of the ship as the trailer progressed. "We had to work out how long it would

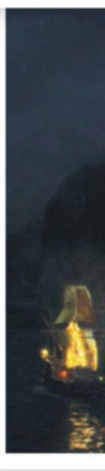
A

B

Historical Research

Frank explains how his team ensured the trailer's VFX work felt as realistic as possible

"We carried out many tests, as it was important to get the right sense of scale and balance between realistic fluids and efficient simulation time. In particular, the handling and storing of the ocean simulation files and meshes proved to be challenging just because of the massive amount of data," explains Frank. "Furthermore, we took many reference pictures of the set and lighting conditions, which helped a great deal in the build and texturing stages later in the project. We also did a lot of research in terms of oceans and ships in open water."



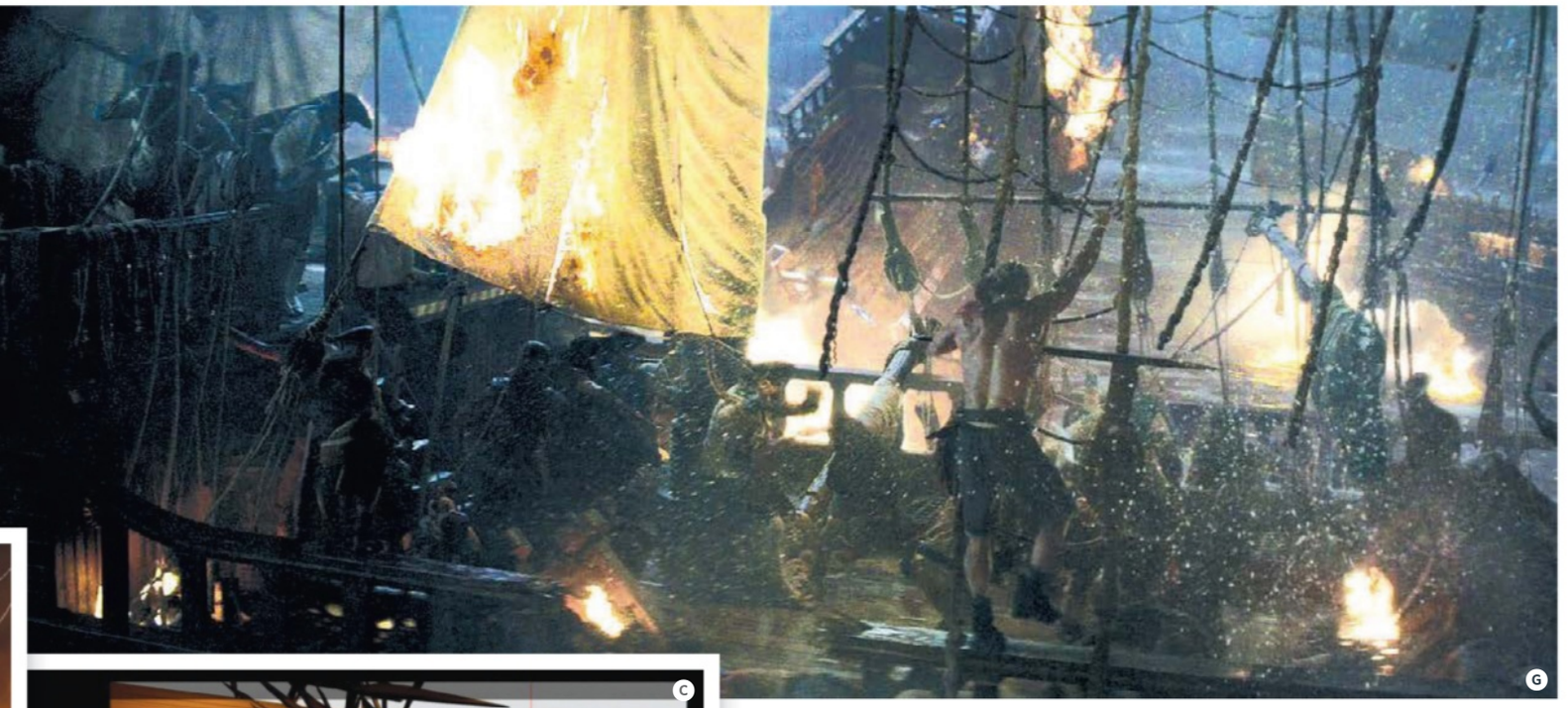
> "Everybody was very excited to get the chance to work on explosions, sinking ships and blood effects, which is quite unique and different to classic advertising work"
>
> **Fabian Frank,** VFX Supervisor for the trailer and lead of MPC's 3D team

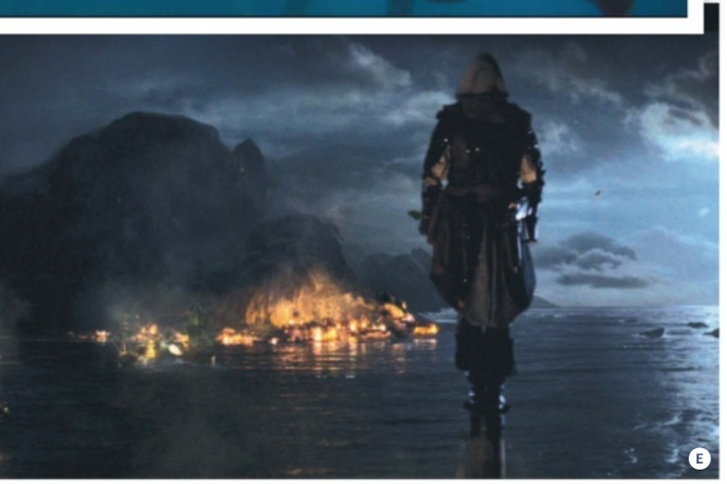
A "The most exciting thing about working at MPC is the variety of projects. It ranges from furry characters to cars and pirate ships, always creative and technical on the highest possible level," exudes Frank regarding the fruits of his labour

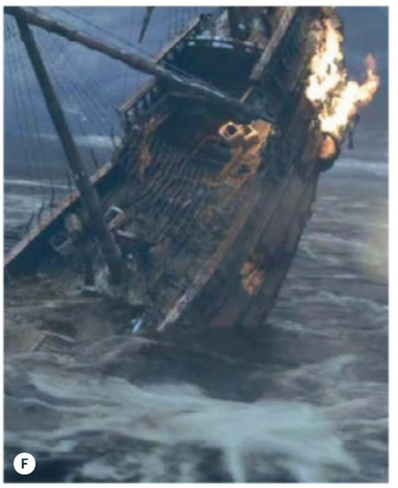
B Making videogame trailers can be a slow business. It took about six months, from pre-visualisation to final delivery, for the trailer for *Black Flag* to be completed, with MPC working on the VFX over a four-week schedule

C The VFX team used Maya and Houdini as their main 3D tools, NUKE for compositing and Photoshop for matte paintings. "For the exchange of simulation data from Houdini to Maya, the alembic file format was our first choice," says Frank

D The floating men that can be seen in the underwater opening scene of the trailer were captured on five different plates, which were then composited together before the scene was enhanced with light effects, debris and bubbles







take the camera to travel from under the water to the top of the mast," remembers Frank. The team, along with the stuntmen that made up most of the cast on the project, tried to get as much real foreground action as they could in-camera, before MPC created a full 3D pre-visualisation of the ship and the entire concurrent camera move. "We used a rough 3D model of the set and worked very closely with Adam to define the camera move before shooting," Frank continues. "The biggest challenge was to integrate the CG backgrounds with everything in the live-action plate."

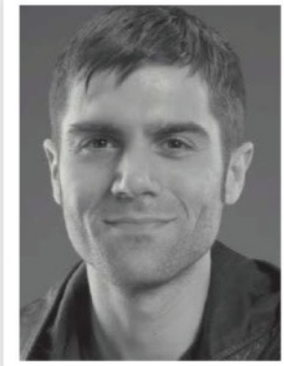
Created over the course of a four-week schedule, the main tools used by MPC for the trailer were Maya and NUKE, with Houdini as the first choice for particle and fluid effects and Photoshop for the matte paintings. "Everything was completed not in one continuous shot but in different sections and layers. This made the timing and integration of the CG and compositing of all the elements particularly tricky – but the final result was all the better for it," explains Frank.

"The project involved the full range of different artistic and technical disciplines, from pre-visualisation to 3D build, 3D rendering, compositing, 2D elements and matte painting," he concludes. "Everybody was very excited to get the chance to work on explosions, sinking ships and blood effects, which is quite unique and different to classic advertising work."

E Several set extensions were created for the trailer. For instance, a vast sea needed to stretch out from the pool the live-action was shot in. The action also required separate plates, utilising green screen and the set, which were then composited together

F Matte paintings were used throughout for set extensions and boat environments, while the addition of CG fog and smoke elements gave the impression that the camera is in the thick of the action. The final product boasts a strong sense of immersion

G "Franck Lambertz, the 2D supervisor, attended the shoot. He was responsible for flagging when something that was shot in camera could not reasonably be altered later," explains Fabian Frank of the behind-the-scenes processes required for consistency



Industry insider

Ben Mauro

Senior art director

We talk to senior art director Ben Mauro about his impressive array of work, including feature films The Hobbit: An Unexpected Journey and Elysium

About the insider

Job Senior art director

Education Industrial Design and Entertainment Design at Art Center College of Design

Website www.artofben.com

Biography Ben Mauro is a US-born concept designer and digital sculptor who has worked for clients such as Lucasfilm, Rhythm & Hues, Activision, EuropaCorp, Universal Pictures, Sony Pictures Animation, Insomniac Games, Design Studio Press and Vishwa Robotics. After college he relocated to Wellington, New Zealand where he worked at Weta Workshop from 2009 to 2013. Over that time Ben contributed to such projects as *The Hobbit* and *Elysium* among many others. He is currently working at the FZD School of Design in Singapore along with several co-workers from Weta, though he continues to offer his unique design services to clients worldwide.

Ben Mauro first began creating 3D art only after a year of working as a concept designer, creature designer and illustrator at Weta Workshop and following an already very successful career as a freelance artist with clients such as Lucasfilm, Sony Pictures Animation and Insomniac Games. "At first, when my 2D design would get approved, it would just be from one angle and I would have to work back and forth with model-makers in order to help bring the design into reality. With 3D the design is already built from all angles and can be 3D-printed or handed off to VFX artists to detail further or use in pre-vis. It just saves everyone a lot of time, because you have solved most of their problems for them already," Mauro explains.

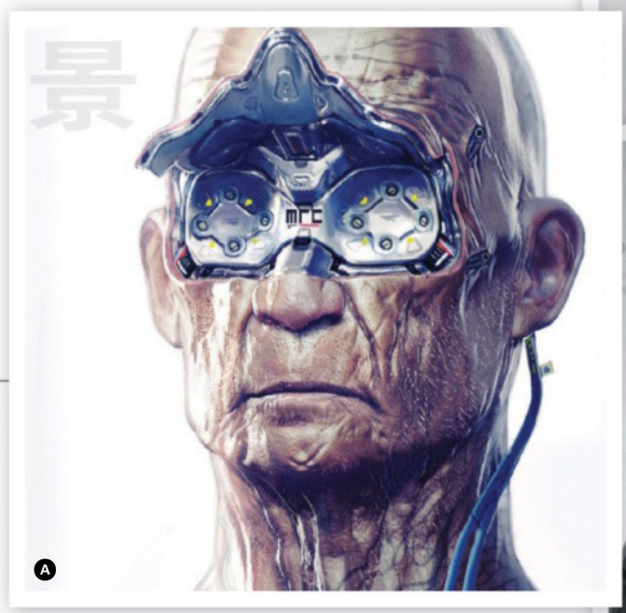
Becoming a designer with such high-profile clients did not come without its various challenges. "In school they always told us to focus on one thing and get good at it, but I thought that was a pretty bad idea, so I just continued to focus on getting better at everything", he tells us, revealing that many of his initial struggles and doubts as a student later became an asset to his work. "It's starting to pay off, giving me the ability to jump around on multiple projects on various genres, designing characters, creatures, environments, props, or weapons without skipping a beat."

Could you describe your typical workday on films such as Elysium and The Hobbit?

Working on *Elysium* was one of the best film experiences I have ever had. Coming in each day and getting to work with and learn from some of my favourite designers on an original sci-fi movie from one of my favourite directors was a dream come true. A typical day on both of the projects would vary depending on where we were in production. Early on, a typical day would be a small team of us getting a brief like 'this week, draw some robot cops' or 'draw some ideas for Dwarven props in this battle scene' and then we would all go off and draw some cool robot cops all week. Towards the end of production a typical day gets more specific – for example, a design will be approved and you will have to refine it further or work out all the design details from multiple angles so the people manufacturing it will know what they need to do. It's a very exciting and ever-changing environment.

How do you go about creating original concept designs, and what are the advantages and disadvantages of working in 3D?

At the moment I use ZBrush, Photoshop, pencils and paper heavily to solve my design problems. I also use KeyShot for mechanical designs to get some really nice and highly photographic renderings. My basic process usually involves sketching out ideas on paper first. Sometimes I go straight into 3D, but I normally like to plan something out first because it's easy to waste time in 3D without having a clear idea of what you're doing from the start. After that I will sculpt everything in ZBrush, then export and paint over it all in Photoshop to achieve a highly detailed piece of conceptual art and sell a client on the idea. The advantage of working in 3D is being able to create highly photographic images that can be rendered from multiple angles quickly. When you can not only draw, design and illustrate ideas as a designer, but then also build them in 3D to a highly finished level so that almost 100 per cent can be translated into the film or game you are working on, it's a very satisfying feeling.



Portfolio highlights

Some recent features that Ben Mauro has worked on:

2013 *Lucy*
2013 *The Amazing Spider-Man 2*
2012 *Precinct 114 (short film)*
2012 *Seventh Son*
2009 - 2012 *The Hobbit: There And Back Again*
2009 - 2012 *The Hobbit: The Desolation of Smaug*
2009 - 2012 *The Hobbit: An Unexpected Journey*
2011 *Man Of Steel*

To advertise in workspace3D please contact
Ryan Ward on 01202 586415 or
ryan.ward@imagine-publishing.co.uk

B

E

C

D

All images © Ben Mauro

Designing for The Hobbit and fantasy

Mauro tells us more about his work as a concept and creature designer/illustrator on the Middle-Earth epic

"I was involved when Guillermo del Toro was directing, and worked on Elven costumes, shields and weapons, early goblin armour and multiple other things... which mostly got cut when Peter [Jackson] took over," Mauro explains. Though he decided to dedicate more time to *Elysium* due to his love of sci-fi, Mauro still worked on *The Hobbit*, visualising creatures and sculpting the Warg heads in the film.

What do you wish you had known when you were less experienced?

It's incredibly important to create personal work outside of the workplace, especially for concept designers, since we are involved so early on in a production and there is no guarantee a job will ever see the light of day. My friends and I all have years of work that we can never show: if you are not constantly creating personal work you could go years and have nothing to show for it. We all started with zero talent or skill at any of this stuff, so just put in the time and years and anything is possible. It's not easy and it is not a fast process, but it is achievable with enough hard work and dedication.

> "Being able to sit down at my laptop and feel like I can do anything is a very powerful thing to me"

A Mauro has found work in multiple countries, and believes that being influenced by different sights, people and cultures is very important for a designer

B This image is named Grey Fox, and is a personal design created by Mauro in 2011 using ZBrush and Photoshop for the book *Nuthin' But Mech*

C Though designing in three dimensions instead of two can take longer, Mauro says the final result and being able to present from all angles justifies the extra time

D "Everyone told me I was stupid for moving down to California... but if I didn't make that big move I certainly would not be as far along as I am now," says Mauro

E "I enjoy working in all genres; my portfolio has a bit of everything," says Mauro. "However I do prefer science fiction over other genres like fantasy or horror."

DISCOVER THE PAST!

www.historyanswers.co.uk

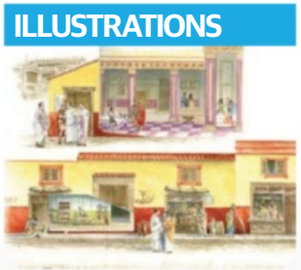
ALL ABOUT HISTORY
NEW
"I thought the Japanese would take over the USA"
Eyewitness account of the Pearl Harbor attack
CAESAR
THE RISE TO POWER
How Julius Caesar transformed Rome from republic to empire
Taj Mahal
How to win a siege
Battle of Hastings
American Civil War
Dawson City
21 discoveries that changed history
NAPOLEON VS WELLINGTON
Wellington won the war. Did Napoleon win history?
"Clay is a slave name"
Muhammad Ali and his battles in and out of the ring
www.historyanswers.co.uk
10 infamous outlaws
A round-up of the all-time most wanted rogues
THE LAST PHARAOH OF EGYPT
The story of Antony, Cleopatra and the end of Ancient Egypt
Vikings
The Cuban Missile Crisis
Genghis Khan
Columbus
The other cold war
Invasion of Saigon
An eyewitness account of South Vietnam's fall
NEW
WHAT CAUSED THE GREAT WAR?
20 key events that led to global conflict
& disastrous defeats
The real Dracula
Vlad the Impaler - folk hero or folk devil?

ALL ABOUT HISTORY

Available from all good newsagents and supermarkets

ON SALE NOW

• Conquest • Outlaws • Battle of Hastings • Muhammad Ali



BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print Tablet Phone Desktop

facebook.co.uk/AllAboutHistory

twitter.com/abouthistorymag

workspace
To advertise in workspace 3D please contact
Ryan Ward on 01202 586415 or
ryan.ward@imagine-publishing.co.uk

Course Focus

FX TD (Houdini) Full Time Program

The Lost Boys School of Visual Effects introduces its new FX TD Houdini course

Course name
FX TD (Houdini) Full Time Diploma Program

Course length 8 months intensive

Fees $29,900 CND

Student requirements Students need to prove they have graduated from high school or are 19 years old. If under 19, applicants need consent from a parent or guardian. They also need to supply a $100 application and assessment fee, letter of recommendation, personal statement and portfolio of six to eight pieces of work. Experience is required with common computer operations and operating systems. Experience in Photoshop, Maya, NUKE or Python is useful, but not required. Starting dates for the program is 6 January 2014.

Website www.lostboys-studios.com

The tutor

Andrew Lowell
The course will be taught by Andrew Lowell, who has worked in a multitude of studios worldwide, including Rhythm & Hues, CIS Vancouver, Animal Logic and more recently as an FX TD for Digital Domain. He has been a Houdini specialist for years, and has taught 3D Graphics classes for SideFX, FXPHD and now Lost Boys. He is also the author of a book on music and animation with Houdini, and is highly recommended as a Houdini expert by Side FX for his work.

The Lost Boys School of Visual Effects has announced its new Effects Technical Director full time program. Developed to be one of the most comprehensive diplomas offered in Houdini and feature film FX in the world, the course teaches the problem-solving skills required to create feature film-quality visual effects, enabling students to hit the ground running.

Term one will see students learn the basics of 3D and FX generalist training with work on surfaces, lighting, shading, rendering and animation. In the final four-month term the FX students will work on an environmental effects project using particles and volume fluid simulations, and an advanced simulations project for which they must create effects such as fire and explosions.

For the course's fourth and final project, students will collaborate with the school's VFX Production teams. Here they will experience the same collaborative environment as in a professional studio, gaining valuable industry experience.

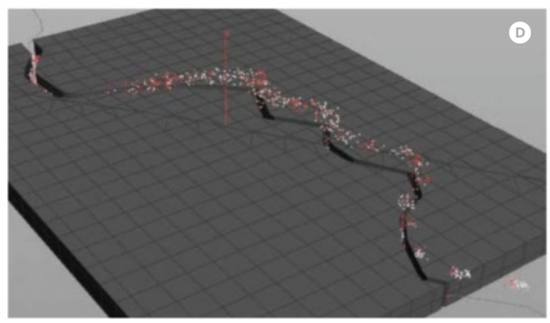
FX industry veteran and Houdini author and trainer Andrew Lowell will be teaching the course, although students will also be given regular exercises and technical demonstrations from visiting industry professionals. "At Lost Boys, our purpose is to train the necessary analytical, creative and technical skills to get started in the visual effects industry as quickly as possible, while still upholding a high standard of excellence," says Senior Educational Administrator Ria Bénard. With the school's current 98 per cent placement rate and extensive ties to local studios, students have all the tools available to quickly graduate industry-prepared.

> "Learn what Houdini is, see it demonstrated, and find out how simple ideas can produce dramatic results"
> **Andrew Lowell,** FX Industry veteran and instructor

A The curriculum is a balance of production simulations, project driven exercises such as filming plates, and technical demos from some of the industry's top professionals

B A still from student Carlos Guzman's FX/UFO project, created in Houdini and NUKE. He was mentored by FX TD teacher Andrew Lowell during this project

C Student Kenji Kosugi's UFO project involved Houdini wire and cloth simulation, Pyro simulation, FumeFX and compositing in NUKE. It was created over the course of two months



D A sample of one of Lowell's demos at the Lost Boys School in Houdini, similar to the effects that he helped create as a TD for the feature films *Thor* and *Transformers*

E Student Raman Siddharta created this project to further understand cloth, fire and smoke effects. Houdini and NUKE were used, and he was also mentored by Lowell

✓iPad ✓iPhone ✓Android phone ✓Android tablet ✓Apple Mac ✓Windows PC

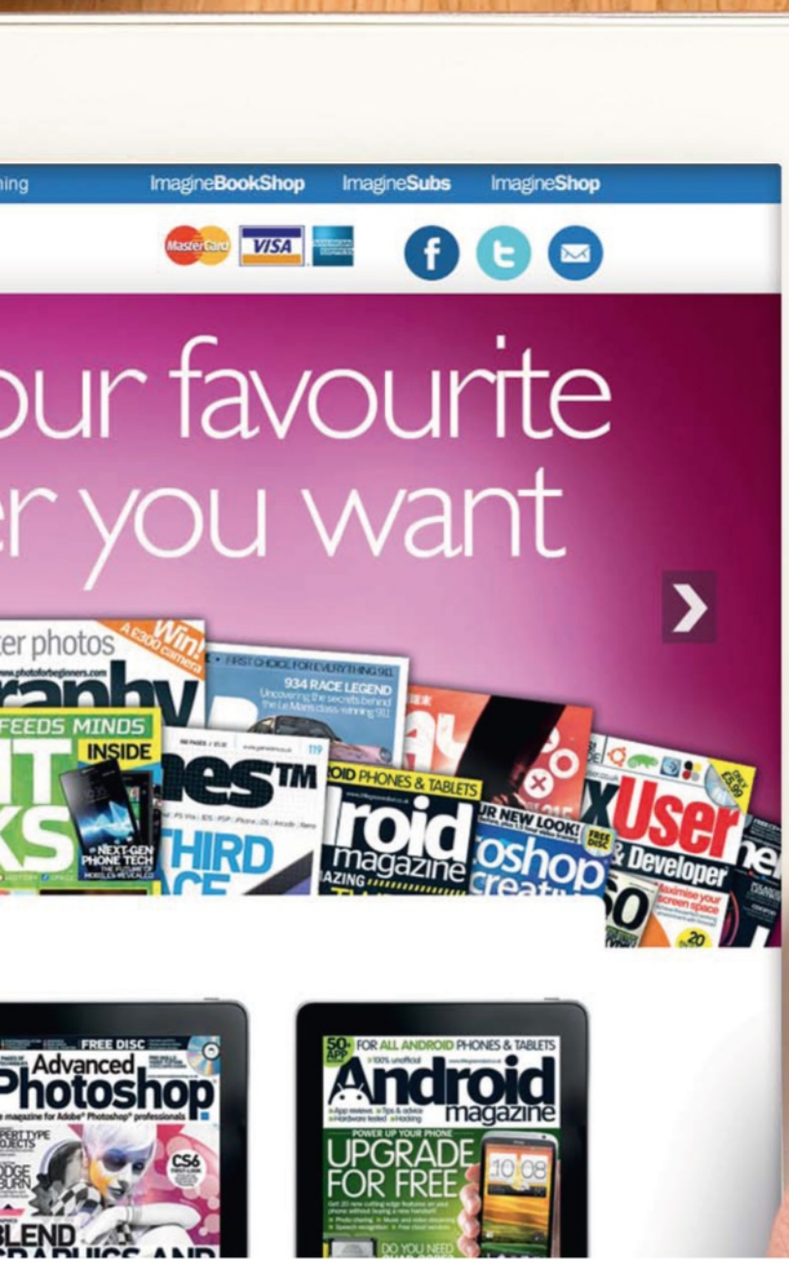
No Disc. No Problem

Many of the files you're looking for can be found on the magazine's website

Imagine digital editions are a new and exciting way to experience our world-leading magazines and bookazines.

To get the most out of your digital editions, be sure to enjoy all of our fantastic features, including:

- **Zoomable text and pictures**
- **In-app browsing**
- **Searchable text**
- **Take your collection with you**
- **Read offline**



To buy more Imagine digital editions and for the latest issues and best offers, please go to **www.GreatDigitalMags.com**

Advanced Photoshop

Android Magazine

IMAGE IS EVERYTHING

www.advancedphotoshop.co.uk

ADVANCED PHOTOSHOP
FREE DISC
Over an hour of expert video tuition
Plus fonts, actions & more
The magazine for Adobe Photoshop professionals
114
PACKED WITH PRO PHOTOSHOP CC ADVICE
BLEND GRAPHICS AND TYPE
75
PROFESSIONAL PHOTOSHOP TIPS
Essential advice from industry experts
• Work with layers • Master digital paint techniques • Expert photo editing
THE PEN TOOL
WHICH DSLR?
INDUSTRY COVER ART
CREATE THIS IMAGE
15 ILLUSTRATION TIPS & TRICKS
CHARACTER CONCEPTS IN CS6
BLEND CGI & PHOTO
RENDER SCI-FI CONCEPT ART
MINISTRY OF SOUND
A selection of expert resources worth $138
Plus fonts, textures & more
DELL XPS 27
SECRETS
Commercial photography is big business, discover how to edit your photo like the experts
DESIGN FOR THE WEB
FANTASY LIGHTING
Over 1.5 hours of expert video tuition
Plus fonts, textures & more
THE FUTURE?
SHOP CC
• The creative industry speaks out
Cloud updates • In-depth CC tutorial
DIGITAL COMPOSITION
ALIEN ENVIRONMENT

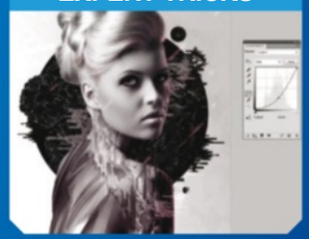
FREE DISC EVERY ISSUE

ADVANCED PHOTOSHOP®

Available from all good newsagents and supermarkets

ON SALE NOW

> Master the pen tool > 75 professional photoshop tips > Blend graphics and type

RETOUCHING	DIGITAL PAINTING	PHOTOMANIPULATION	GRAPHICAL ART	EXPERT TRICKS
				

BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

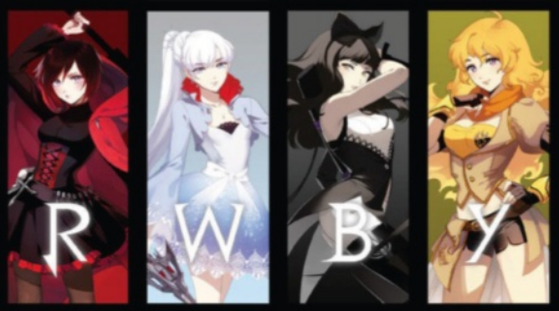
Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print | Tablet | Phone | Desktop

facebook.com/AdvancedPhotoshop

twitter.com/advancedpshop



POSER IS A PROUD SPONSOR OF THE VIDEO SERIES **RWBY** BY ROOSTER TEETH

The Animators' Secret

Monty Oum, Shane Newville and the whole animation team at Rooster Teeth use Poser Pro to animate, render and deliver online hits like "Red vs. Blue" and their newest anime series "RWBY". Why? Because it works. It's fast. It's powerful. It makes animation easy. Poser gives the RWBY team the freedom to get creative, to focus on their story, and it's been the centrepiece of their production pipeline since day one. With Poser, animators bring their stories to life. And that's no secret.

For more information:
poser.smithmicro.com/poser10-poserpro2014/

POSER®

Professional 3D Figure Design & Animation

What Will You Create?®

SMITH MICRO SOFTWARE

Poser, Poser Pro, the Poser Logo, and the Smith Micro Logo are trademarks, or registered trademarks of Smith Micro Software, Inc. Poser copyright © 1991-2013. RWBY © 2013 Rooster Teeth Productions, LLC. All rights reserved.

DAVE SCHOOL

The Digital Animation & Visual Effects School

Enroll Now!

The DAVE School is now accepting applications for our 1-year career program in computer animation for Film, TV and Gaming.

Train in Maya, Modo, Nuke & ZBrush!
Learn to work as part of a studio pipeline!
International students are welcome!
Housing is available!

ACICS

NOW ACCREDITED BY THE ACCREDITING COUNCIL FOR INDEPENDENT COLLEGES AND SCHOOLS!

www.DaveSchool.Com

The DAVE School is located on the backlot of

UNIVERSAL STUDIOS®

in Orlando, Florida!

THE DAVE SCHOOL IS NOT OPERATED BY NOR AFFILIATED WITH UNIVERSAL ORLANDO®